22

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3924 MEADE ST.
DENVER, COLORADO

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PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

ZENITH MODELS L2571R, U, L2572R, U, L2573E, U, L2574R, U, L2575E, U, L2592R, U, L2593H, U, L2876E, R, U, L2878R, U, L2879E, U, L2894HU (Ch. 22L20 & Radio Ch. 10L20)

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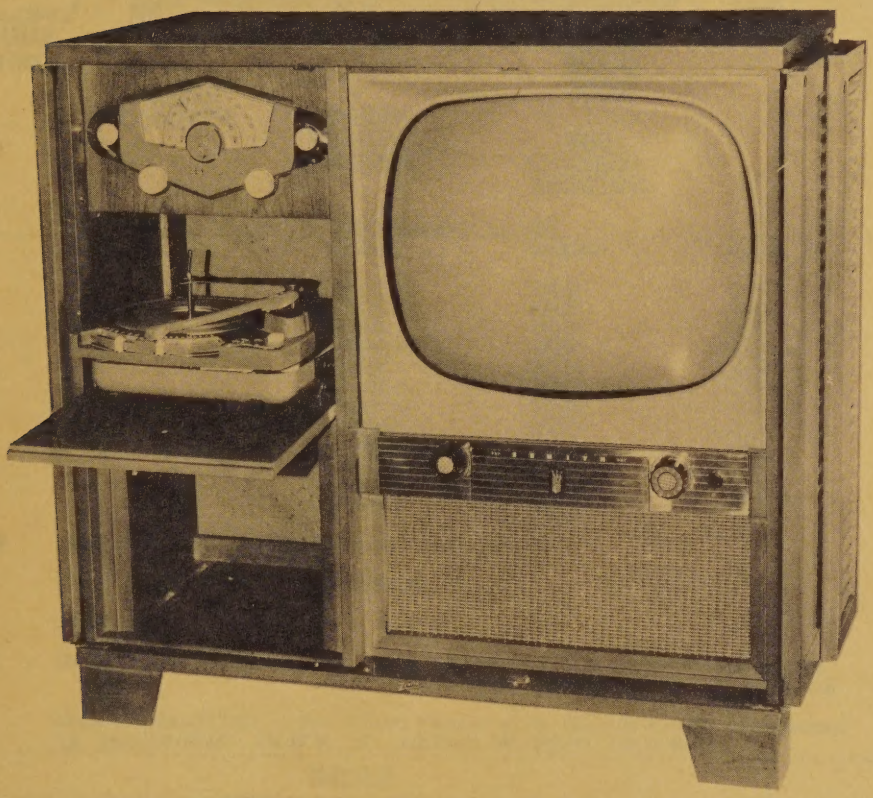

MODEL L2593H

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DATE 1-54 SET 227 FOLDER 16

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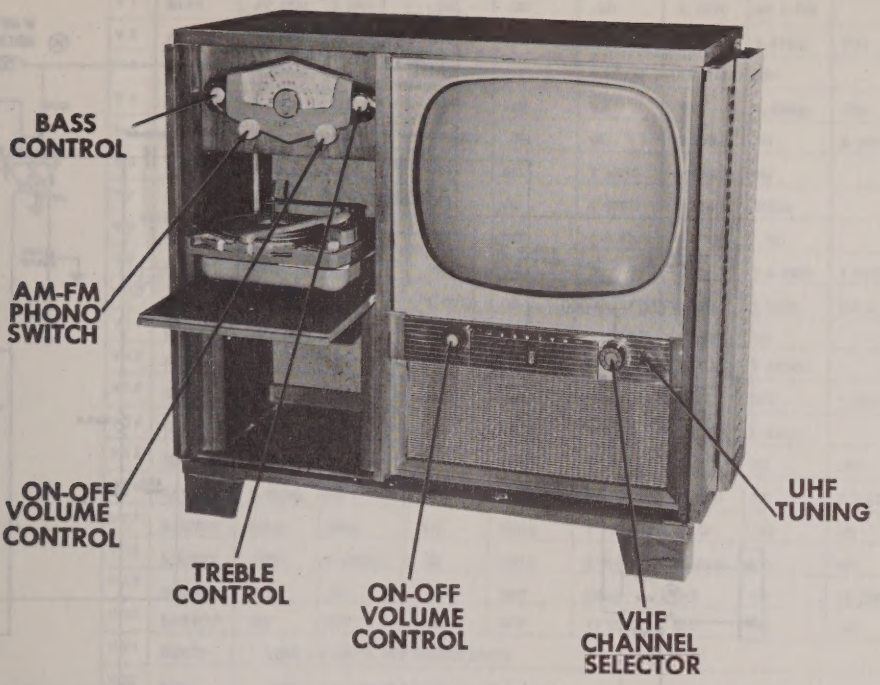

ZENITH MODEL L2593H

TRADE NAME	ZENITH	MODELS	CHASSIS	RADIO
		L2571R, U	22L20	None
		L2572R, U	22L20	None
		L2573E, U	22L20	None
		L2574R, U	22L20	None
		L2575E, U	22L20	None
		L2592R, U	22L20	10L20
		L2593H, U	22L20	10L20
		L2876E, U	22L20	None
		L2876R, U	22L20	None
		L2878R, U	22L20	None
		L2879E, U	22L20	None
		L2894H U	22L20	10L20

MANUFACTURER Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.

TYPE SET TV-AM-FM-Phono Combination Receiver

TUBES Twenty-five (TV) Ten (Radio)

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.42 Amp. @ 117 Volts AC (TV)
.89 Amp. @ 117 Volts AC (Radio)

TUNING RANGE Channels 2 thru 13 VHF, 14 thru 83UHF, Video IF 45.75, Sound IF 41.25MC (Intercarrier)
FM Radio 88-108MC, FM IF 10.7MC, AM Radio 540-1620KC, AM IF 455KC

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FOR SERVICE INFORMATION ON RECORD CHANGER MODEL 14053, SEE SET 226, FOLDER 13.

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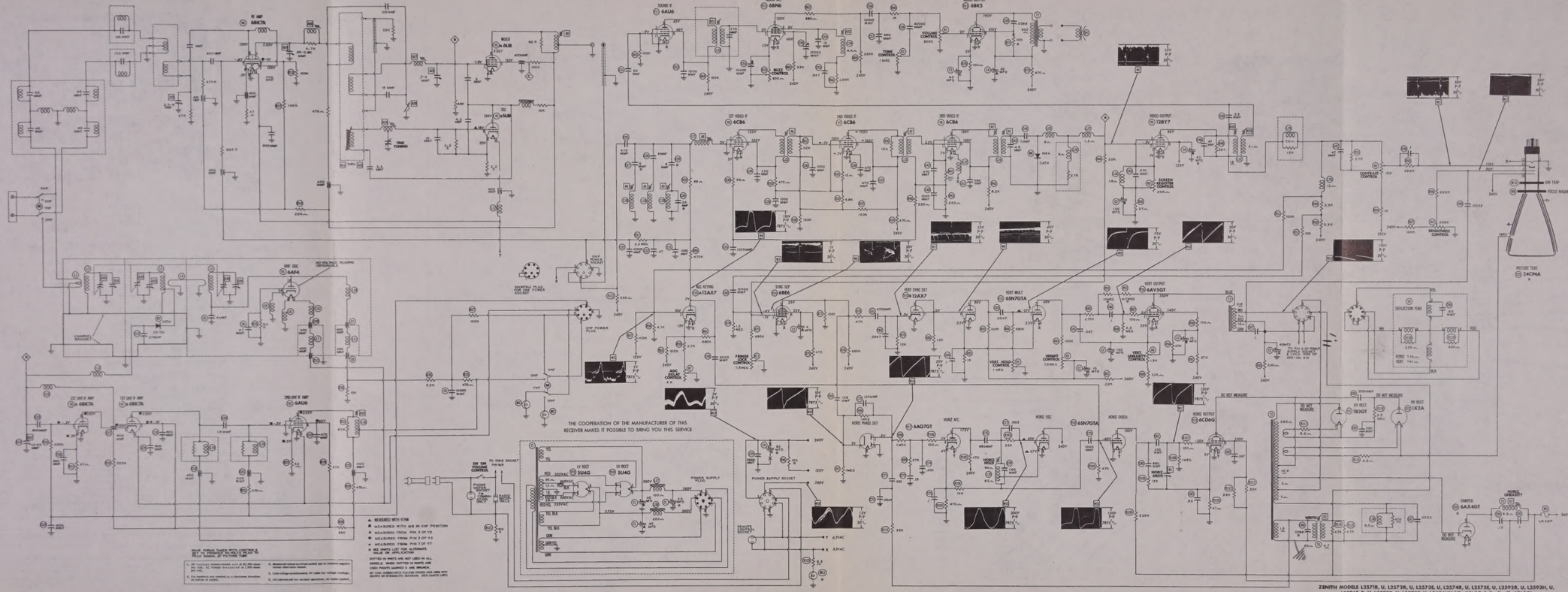

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A PHOTOFACT STANDARD NOTATION SCHEMATIC

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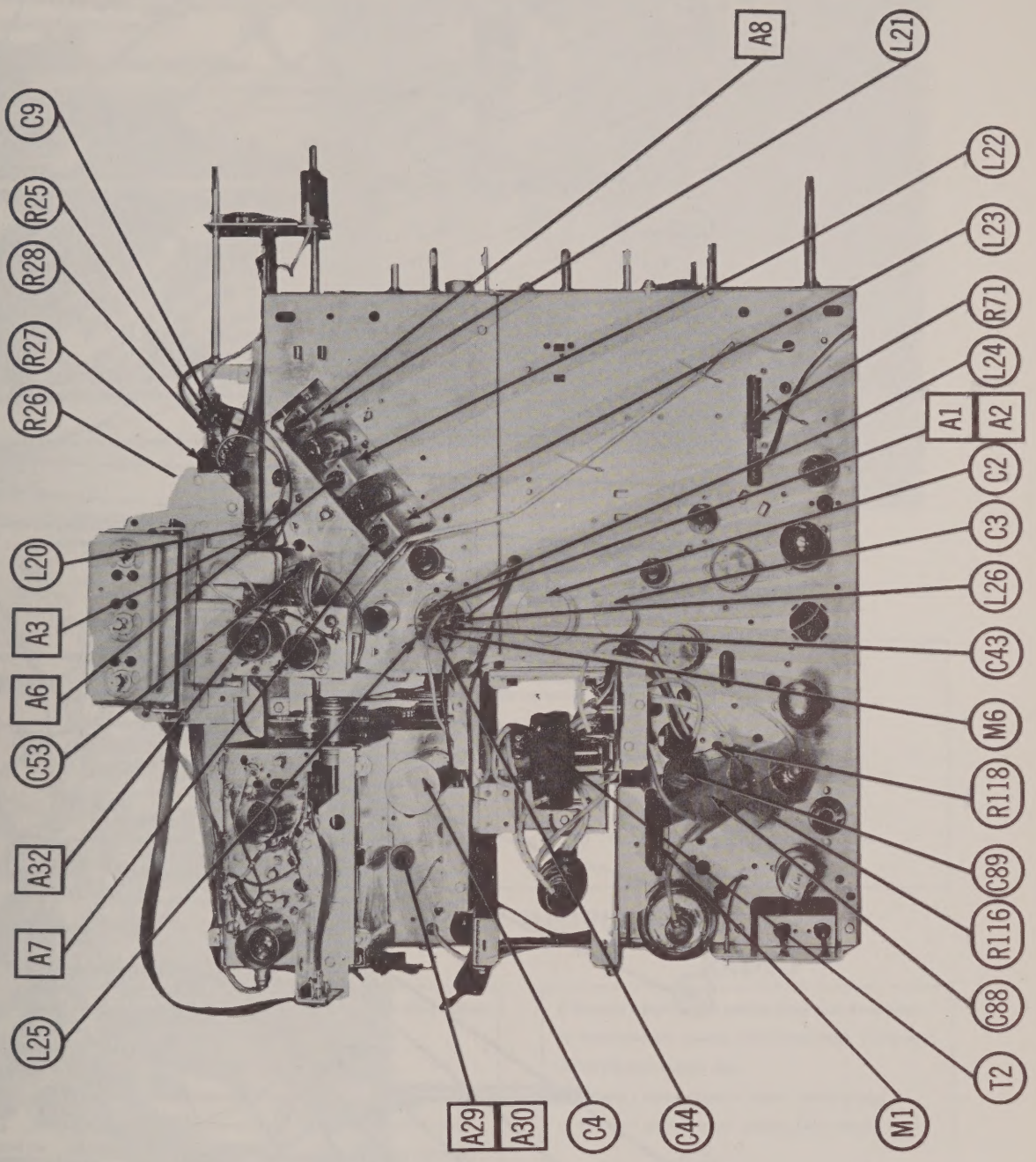

CHASSIS TOP VIEW

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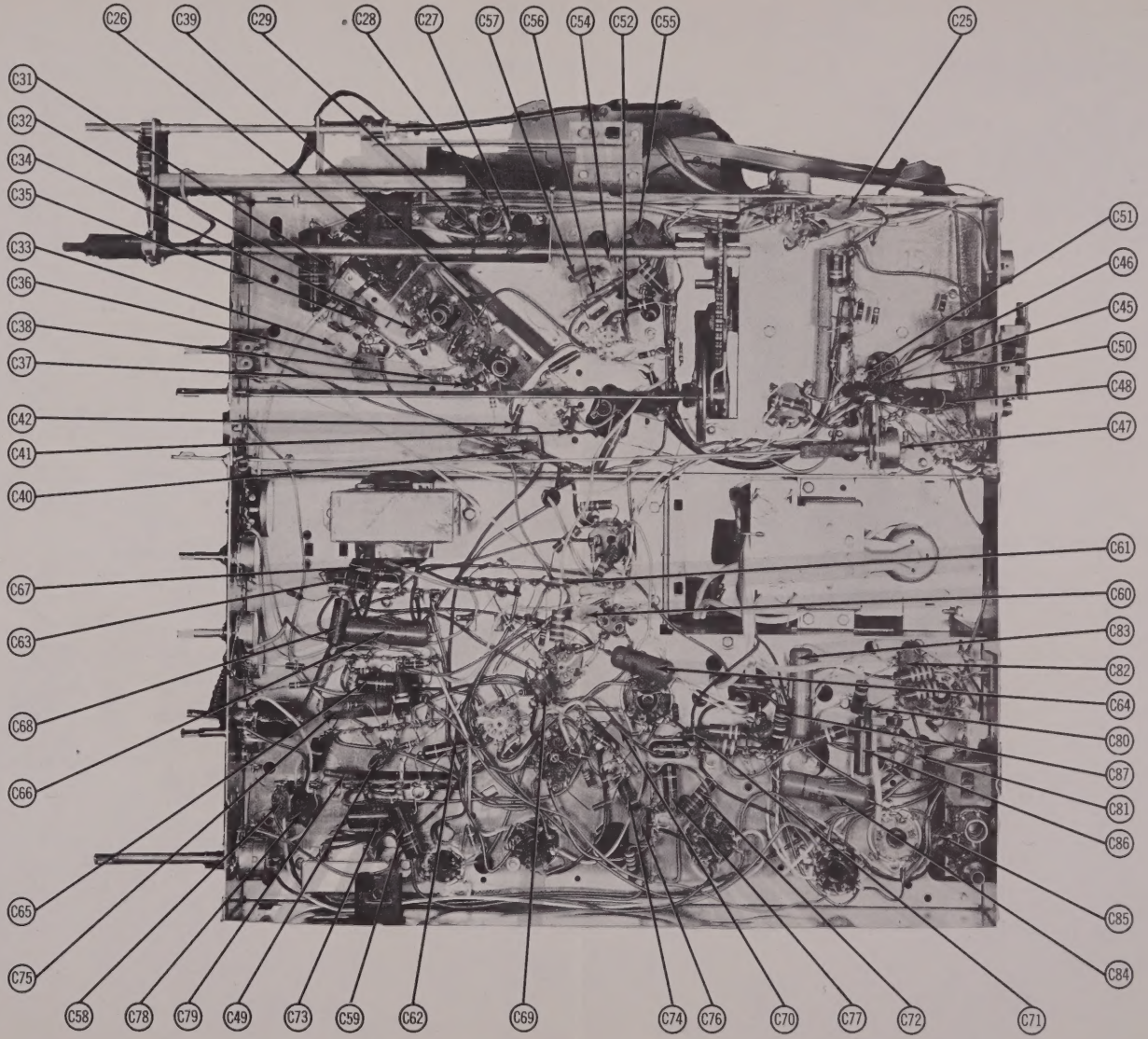

TV CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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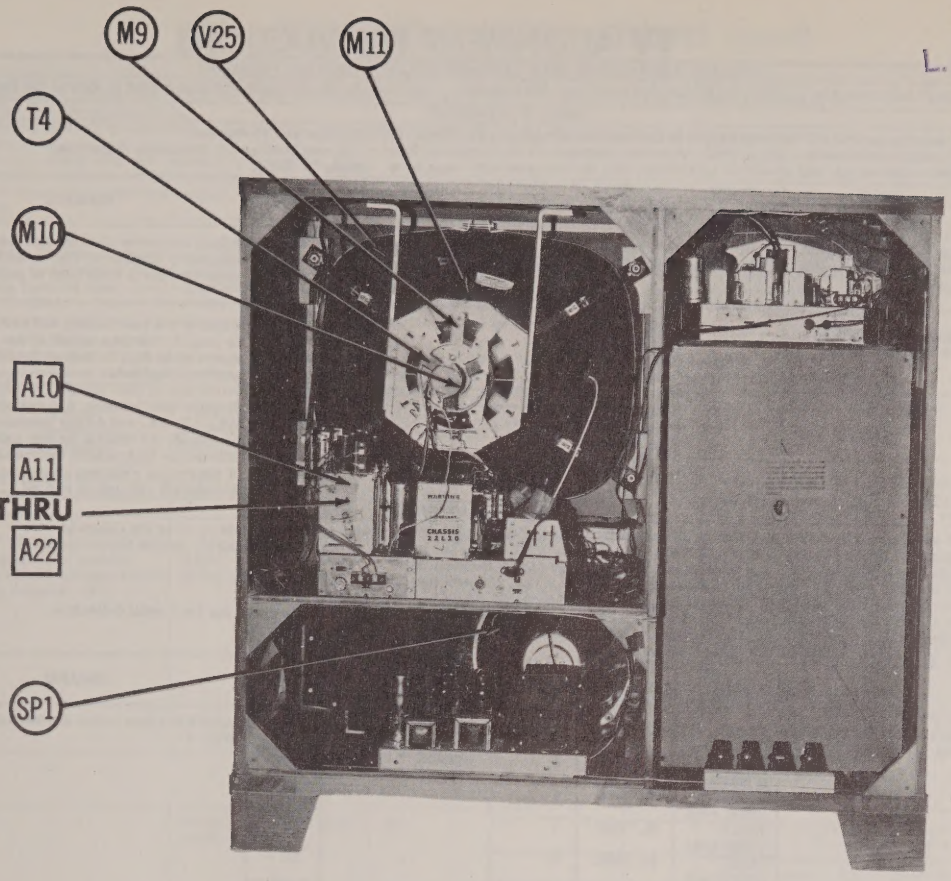

CABINET—REAR VIEW
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold control until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B1) for greatest picture width.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

AGC DELAY CONTROL ADJUSTMENT

Connect the vertical amp. of an oscilloscope thru 10KΩ to point (A). Select the strongest TV signal available and adjust the delay control for 2.5 volts peak output.

DISASSEMBLY INSTRUCTIONS

TV

1. Remove 9 push on type and 1 set screw type (UHF tuning) control knobs from front panel.
2. Disconnect transmission line.
3. Remove 6 wood screws. Remove rear cover.
4. Disconnect radio AC line from TV chassis rear aporn.
5. Disconnect TV and radio speaker leads from spearker.
6. Disconnect power supply plug, HV load, CRT socket, yoke plug and ground lead.
7. Remove 4 chassis bolts. Remove main chassis.
8. Remove 2 chassis bolts. Remove power supply chassis.
9. Remove 4 speaker nuts. Remove speaker.

RADIO

1. Remove 5 push on type control knobs from front panel.
2. Disconnect AM antenna, phono motor plug, pickup plug, treble and bass control plug.
3. Remove 1 screw. Remove treble control ground.
4. Remove 4 chassis bolts. Remove radio chassis.

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 2 volt bias supply to the ungrounded side of C31. Connect the positive lead to chassis.
Connect the synchronized sweep volta ge from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator out put lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMF	High side to Pin 1 (grid) of 6CB6 (V5). Low side to chassis.	44MC (10MC Swp)	41.25MC 45.75MC	Any non-interfering channel	Vert. amp through 10KΩ to point (A). Low side to chassis.	A1, A2	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1. Attenuate generator for 3 volts peak to peak on scope.
2.	"	High side to point (B). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3, A4 A5	Remove the bias battery and set scope gain to amplify the trap region of the response curve as in Fig. 2. Adjust for MINIMUM marker amplitude.
3.	"	"	"	42.75MC 45.0MC 45.75MC	"	"	A6, A7 A8, A9	Replace bias battery. Alternately adjust A6, A7, A8, and A9 for response similar to Fig. 3. A6 affects the low side and A7 affects the high side of the response curve. If the proper response cannot be obtained SLIGHTLY retouch A1 and A2.

OSCILLATOR ALIGNMENT

The master oscillator adjustment of A10 is to be made only if the individual channel oscillator adjustment fails to bring the channels within the range of the fine tuning control. If channels 2 through 6 fall within the range of the fine tuning control, but the higher channels do not, slight readjustment of A10 may be necessary to bring the higher channels in.
Connect the negative lead of a 1 volt bias to the ungrounded side of C31. Connect the positive lead to chassis.
Turn the oscilloscope gain up so that the sound trap notch in the response curve becomes visible.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC Swp)	59.75MC	2	Vert. amp to point (A). Low side to chassis.	A11	Adjust to place sound marker in notch as in Fig. 4.
			63MC (10MC Swp)	65.75MC	3		A12	
			69MC (10MC Swp)	71.75MC	4		A13	
			79MC (10MC Swp)	81.75MC	5		A14	
			85MC (10MC Swp)	87.75MC	6		A15	
			177MC (10MC Swp)	179.75MC	7		A16	
			183MC (10MC Swp)	185.75MC	8		A17	
			189MC (10MC Swp)	191.75MC	9		A18	
			195MC (10MC Swp)	197.75MC	10		A19	
			201MC (10MC Swp)	203.75MC	11		A20	
			207MC (10MC Swp)	209.75MC	12		A21	
			213MC (10MC Swp)	215.75MC	13		A22	

RF AND MIXER ALIGNMENT

Connect a jumper from the turret AGC (yellow) lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	69MC (10MC Swp)	67.25MC 71.75MC	4	Vert. Amp. thru 10KΩ to point (C). (Accessible on top of tuner) Low side to chassis.	A23, A24, A25	Adjust for response similar to Fig. 5.
6.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	"	"	A26, A27 A28	Adjust A26 and A27 for symmetry of response as in Fig. 6. If band pass is too great or too small adjust A28.

FIG. 1

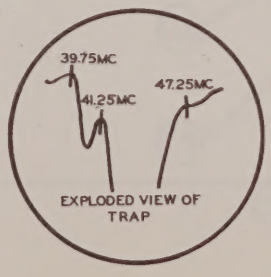

FIG.2

FIG.3

FIG4

FIG.5

TV ALIGNMENT INSTRUCTIONS (cont)

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SOUND IF ALIGNMENT

Connect an attenuator (Zenith part #S-17203 or equivalent) in series with the receiver antenna. Tune in a tone modulated TV signal and adjust the attenuator until the signal falls below the limiting level of the 6BN6 limiter-detector, as evidenced by a hiss similar to superregeneration.
Adjust the sound take-off transformer (A29 and A30), the sound IF transformer (A31) and the quadrature coil (A32) for maximum sound of best quality.
Adjust the buzz control (R10) for minimum intercarrier buzz.
If the intercarrier buzz cannot be eliminated with buzz control check the setting of the AGC delay adjustment.
If during the sound IF alignment the signal rises above the limiting level (hiss disappears) increase the attenuation until the hiss returns.

UHF TUNER ALIGNMENT

Alignment of the UHF tuner should not be attempted in the field unless proper test equipment is available. If a UHF marker is not available it is possible to use another TV receiver equiped with an S-19670 tuner known to be calibrated. Couple the two tuners loosely (operate them closely together) to inject a marker. This method furnished a marker source for all channels above channel 22. To obtain a marker for channel 22, set the signal source tuner to channel 14. Always subtract 8 channels for the oscillator frequency required. To obtain a channel 83 marker, set the source receiver to channel 75.

Switch receiver to UHF position.
Connect the negative lead of a 2 volt bias supply to the ungrounded side of C31. Connect positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	470MMF	High side to point (D). Low side to chassis.	44MC (10MC Swp)	42.75MC 45.0MC 45.75MC	Any non-interfering UHF channel	Vert. amp thru 10KΩ to point (A). Low side to chassis.	A33	Adjust to obtain overall IF response curve similar to Fig. 3. Attenuate generator output to maintain 3 volts peak to peak on scope.
8.	See Fig. 8	Across UHF antenna terminals through matching network. (Fig. 8)	713MC (20MC Swp)	711.25MC	54	"	A34	Tuner rocker arm should be in the horizontal position. If necessary, loosen set screw and adjust tuner shaft so that rocker arm is horizontal with indicator set to channel 54. Do not adjust A34 unless oscillator calibration is off more than three channels. If necessary, adjust A34 for response similar to Fig. 7. with video marker at 50%. The image (weaker response) will appear also. The response towards the counter clockwise position of A34 is the proper response.
9.	"	"	"	"	"	"	A35, A36 A37	Adjust for maximum amplitude and symmetry of response curve as in Fig. 7.
10.	"	"	473 MC (20MC Swp)	471.25MC	14"	"		Check for response similar to Fig. 7. If oscillator is off more than 3 channels, adjust the oscillator travel (osc., mixer, and ant. travel. Adjustments are the three round thumb screws on top of tuner). Adjustment to scale. Care must be used in making this adjustment so as not to move rocker arm out of its bearing. Set the mixer and antenna travel adjustments for maximum response.
11.	"	"	887MC (20MC Swp)	885.25MC	83	"	A38, A39, A40	Set A38 to scale as in Fig. 7. Adjust A39, and A40 for maximum response and symmetry.
12.	Check calibration on channels 14, 54 and 83. If necessary, repeat steps 8, 9, 10 and 11.							

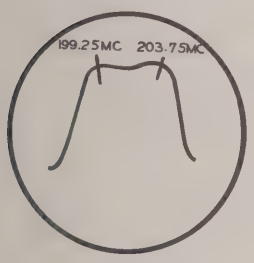

FIG.6

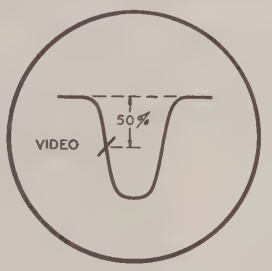

FIG.7

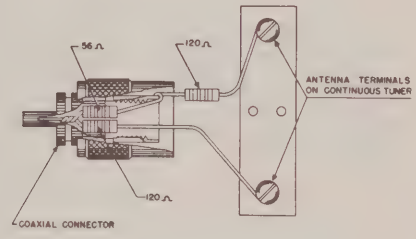

FIG. 8

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RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use Zenith alignment wrench 68-19 or equivalent.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
13.	.05MFD	High side to pin 2 (grid) of 12AT7 (V27). Low side to chassis.	455KC (400~Mod)	BC	Low frequency end of dial	Across voice coil	A41,A42 A43,A44 A45,A46	Adjust for maximum deflection.
14.		Loop	1600KC	"	1600KC	"	A47	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
15.		"	1400KC	"	Tune to 1400KC signal	"	A48, A49	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect a 2Meg isolating resistor in series with the DC probe of the VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
16.	.05MFD	High side to Pin 1 (grid) of 6AU6 (V30). Low side to chassis.	10.7MC (Unmod)	FM	Any	DC probe to point (E). Common to chassis.	A50	Adjust for maximum deflection.
17.	"	"	"	"	"	DC probe to point (F). Common to chassis.	A51	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
18.	"	High side to Pin 1 (grid) of 6BA6 (V29). Low side to chassis.	"	"	"	DC probe to point (G). Common to chassis.	A52, A53	Adjust for maximum deflection.
19.	"	High side to Pin 1 (grid) of 6BA6 (V28). Low side to chassis.	"	"	"	"	A54, A55	"
20.	"	High side to Pin 2 (grid) of 12AT7 (V27). Low side to chassis.	"	"	"	"	A56, A57	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
16.	.05MFD	High side to pin 2 (grid) of 12AT7 (V27). Low side to chassis.	10.7MC (450KC Swp)	FM	Any	Vert. Amp. to point (G). Low side to chassis.	A52,A53 A54,A55 A56,A57	Adjust for maximum amplitude and symmetry as in Fig. 9.
17.	"	"	"	"	"	Vert. Amp. to point (E). Low side to chassis.	A50	"
18.	"	"	"	"	"	Vert. Amp. to point (F). Low side to chassis.	A51	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 10. SLIGHTLY retouch A50 for maximum amplitude and straightness of crossover lines. Continue alignment with step 21.

FM RF AND MIXER ALIGNMENT

Remove line antenna.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
21.	270Ω carbon resistor	High side to FM antenna terminal. Low side to chassis.	98MC (Unmod.)	FM	98MC	DC probe thru 2Meg resistor to point (G). Common to chassis.	A58	Adjust for maximum deflection.
22.	"	"	"	"	"	"	A59	"

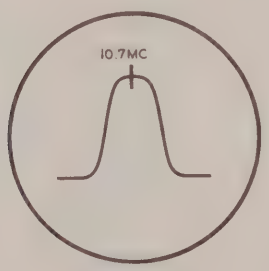


FIG.9

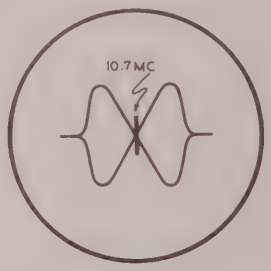
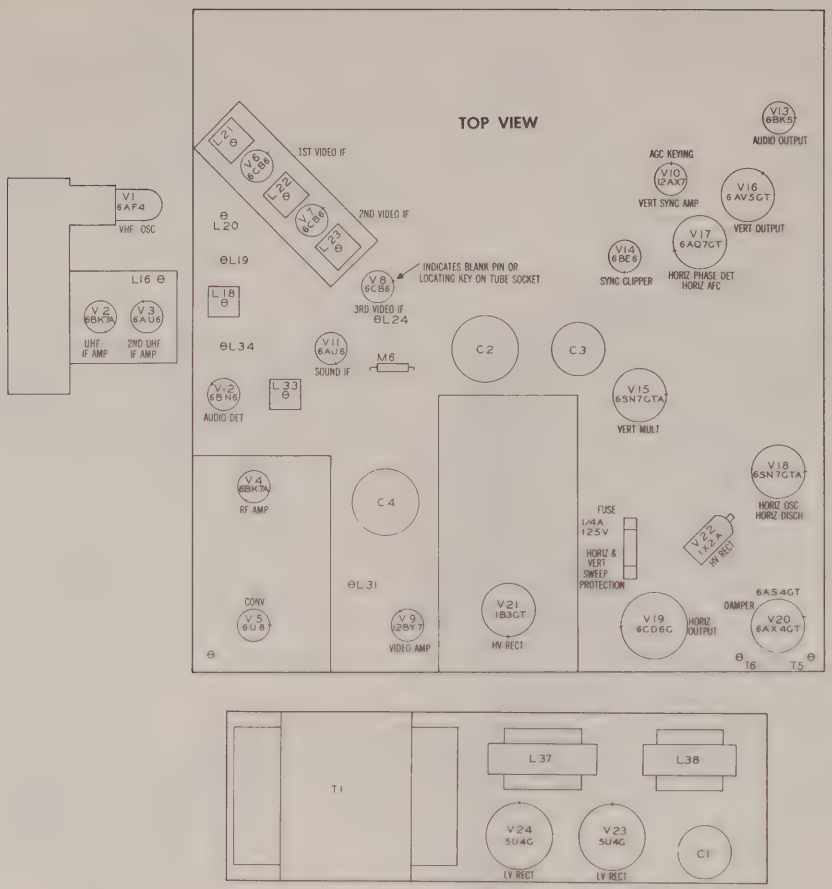


FIG.10

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V23, V24**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V5, V6, V7, V8, V9 (V1 UHF only)**
No pic, no sound, has snow - **V4, V5, V6**
No pic, has sound, has raster - **V9, V25**
Has pic, no sound - **V11, V12, V13**
Overloaded picture - **V10**

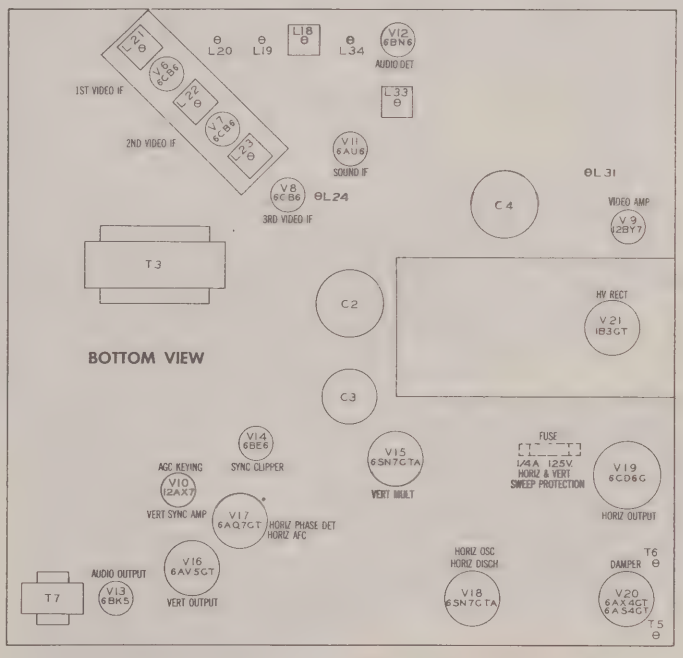
SYNC FAILURE
No vert. sync - **V10, V14, V15, V16**
No horiz. sync - **V14, V17, V18**
No vert. or horiz. sync - **V14**

SWEEP FAILURE
No raster, has sound - **V18, V19, V20, V21, V22, V25, Fuse (M1)**
No vertical deflection - **V15, V16**
Poor vert. linearity or foldover - **V15, V16**
Poor horiz. linearity or foldover - **V18, V19, V20**
Narrow picture - **V18, V19, V20, V21, V22, V23, V24**
Vert. off freq. - **V10, V14, V15, V16**
Horiz. off freq. - **V14, V17, V18**

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	■† 4KΩ	3. 3KΩ	. 2Ω	. 1Ω	. 1Ω	3. 3KΩ	■† 4. KΩ		
V 2	6BK7A	†■ 1KΩ	†■ 69KΩ	INF	. 1Ω	0Ω	INF	3. 6Meg	47Ω	0Ω
V 3	6AU6	3. 6Meg	0Ω	. 1Ω	0Ω	■†500Ω	†■ 115KΩ	82Ω		
V 4	6BK7A	† 1KΩ	65KΩ	INF	. 1Ω	0Ω	INF	3. 6Meg	37Ω	0Ω
V 5	6U8	† 10. 5KΩ	68KΩ	† 100KΩ	. 2Ω	0Ω	† 500Ω	0Ω	2. 2KΩ	4. 4KΩ
V 6	6CB6	1. 1Meg	500Ω	. 1Ω	0Ω	† 80KΩ	† 80KΩ	0Ω		
V 7	6CB6	70KΩ	75KΩ	. 1Ω	0Ω	† 600Ω	† 600Ω	75KΩ		
V 8	6CB6	220Ω	370Ω	. 1Ω	0Ω	† 8. 4KΩ	† 8. 4KΩ	0Ω		
V 9	12BY7	28Ω	3KΩ	28Ω	0Ω	0Ω	. 1Ω	† 6. 8KΩ	† 7KΩ	28Ω
V 10	12AX7	700KΩ	4. 7KΩ	5. 6KΩ	0Ω	0Ω	1. 2KΩ	1. 2KΩ	15KΩ	. 1Ω
V 11	6AU6	100KΩ	0Ω	. 1Ω	0Ω	† 100KΩ	† 100KΩ	0Ω		
V 12	6BN6	300Ω	. 3Ω	0Ω	. 1Ω	† 33KΩ	220KΩ	† 330KΩ		
V 13	6BK5	† 1KΩ	INF	16KΩ	. 1Ω	0Ω	100Ω	INF	† 650Ω	INF
V 14	6BE6	22KΩ	0Ω	. 1Ω	0Ω	100KΩ	† 47KΩ	1. 5Meg		
V 15	6SN7GT	1Meg	†† 3Meg	1KΩ	1. 2KΩ	†† 122KΩ	1KΩ	0Ω	. 1Ω	
V 16	6AV5GT	2. 2Meg	.1Ω	800Ω	2. 2Meg	†† 650Ω	† 18KΩ	0Ω	† 18KΩ	
V 17	6AQ7GT	2Meg	1Meg	0Ω	3Meg	† 47KΩ	470Ω	. 1Ω	0Ω	
V 18	6SN7GT	47KΩ	¶ 220KΩ	0Ω	33KΩ	† 200Ω	10. 6KΩ	. 1Ω	0Ω	
V 19	6CD6G	INF	. 1Ω	47Ω	INF	1Meg	INF	0Ω	†† 17KΩ	TOP CAP ¶ 15Ω
V 20	6AX4GT	INF	INF	INF	INF	†† 110Ω	INF	0Ω	. 1Ω	
V 21	1B3GT	PINS 1-8 HAVE INF RESISTANCE								TOP CAP ¶ 300Ω
V 22	1X2A	PINS 1-8 HAVE INF RESISTANCE								TOP CAP ¶ INF
V 23	5U4G	INF	9KΩ	9KΩ	13Ω	INF	12Ω	INF	9KΩ	
V 24	5U4G	INF	120KΩ	INF	30Ω	INF	28Ω	INF	120KΩ	
V 25	24CP4A	0Ω	† 320KΩ	PIN 10 ††100Ω	PIN 11 †1250KΩ	PIN 12 . 1Ω				

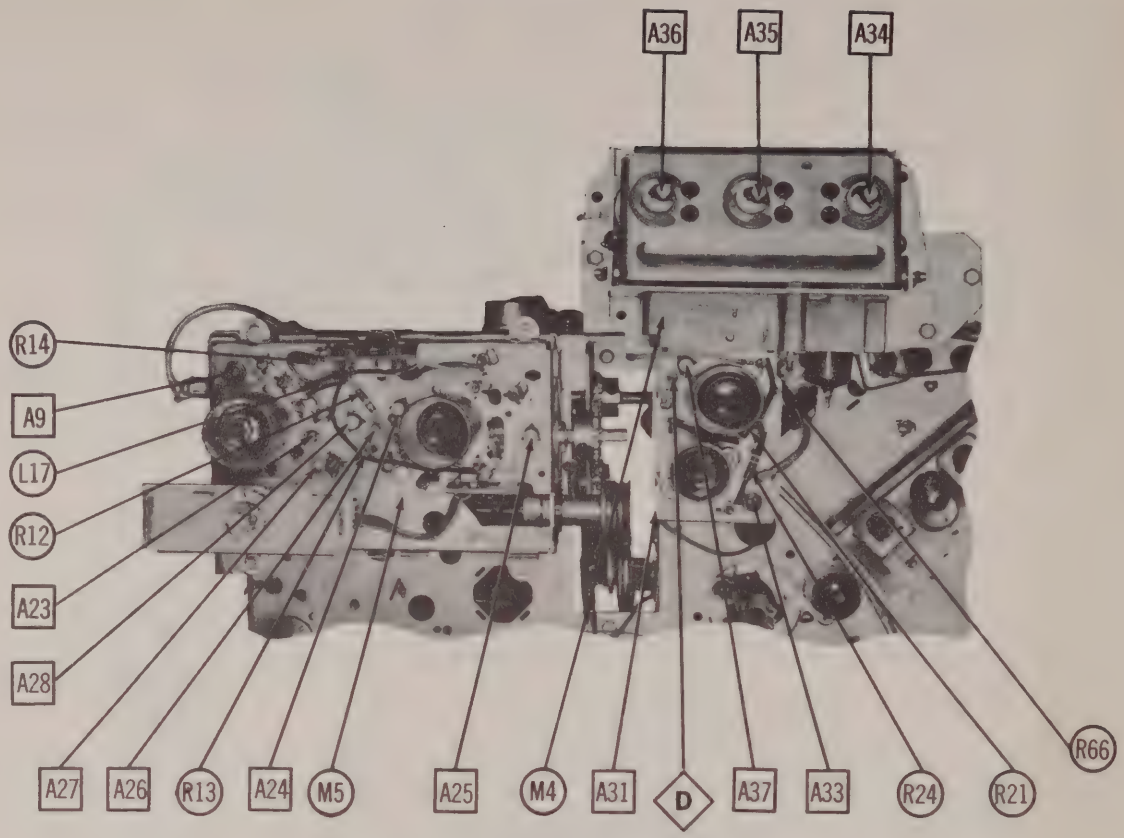
† MEASURED FROM PIN 8 OF V23.
†† MEASURED FROM PIN 8 OF V24.
¶ MEASURED FROM PIN 3 OF V20.
■ MEASURED IN UHF POSITION.



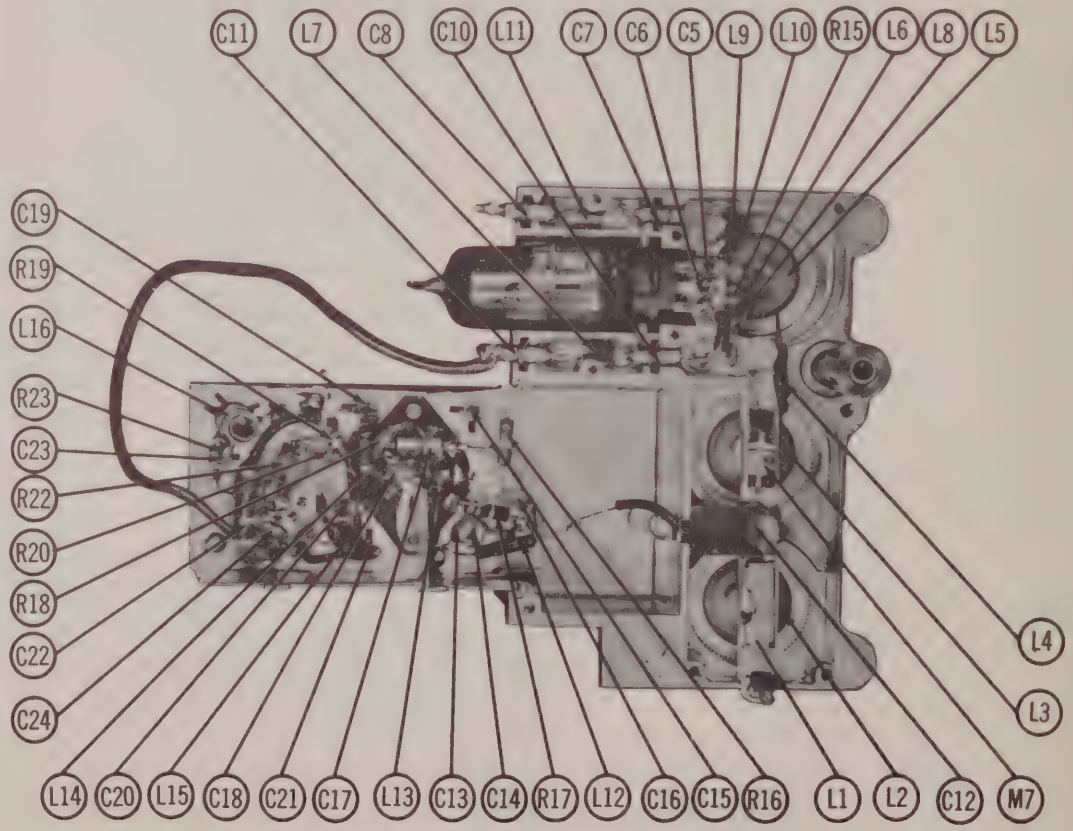
TUBE PLACEMENT CHART

SET 227 FOLDER 16

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



UHF-VHF TUNER-TOP VIEW

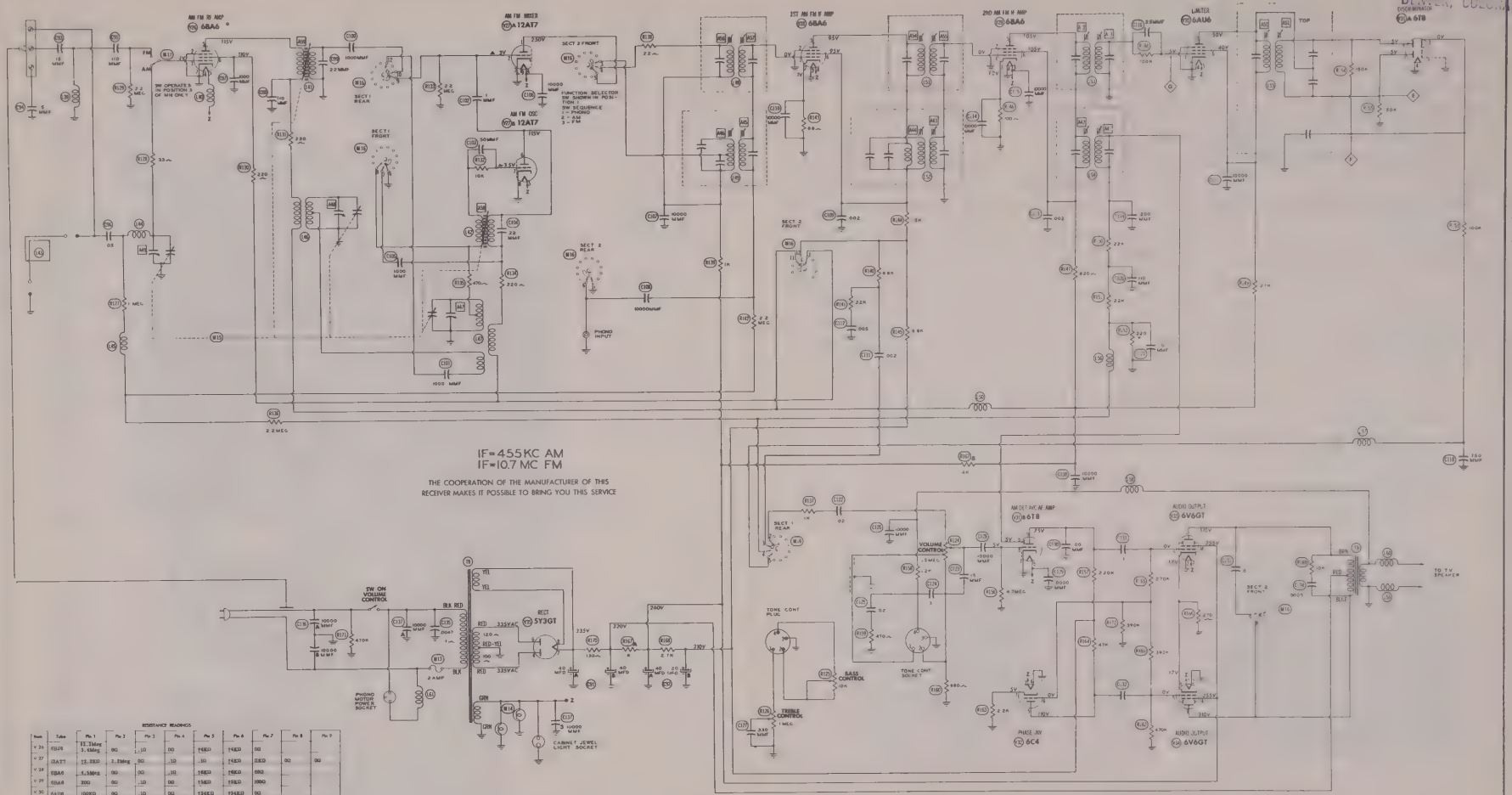


UHF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 GRADE ST
DENVER, COLORADO

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO


IF=4.55KC AM
IF=10.7 MC FM
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
RESISTANCE READINGS
ALL MEASUREMENTS TAKEN IN "AM" POSITION UNLESS OTHERWISE INDICATED
* MEASURED IN "FM" POSITION
† MEASURED FROM PIN 3 OF V35
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
227-16

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ZENITH MODELS L2571R, U, L2572R, U, L2573E, U, L2574R, U, L2575E, U, L2592R, U, L2593H, U, L2876E, R, U, L2878R, U, L2879E, U, L2894HU (Ch. 22L20 & Radio Ch. 10L20)

RADIO SCHEMATIC

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See "Loss of High Voltage."

INSUFFICIENT SWEEP

Check by substitution V18, V19, V20, V23 and V24. Check adjustments B1, B2 and B3. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check R111, R112, R114, R115, C82, C84, C85, T2, T4A and other associated components.	Check C79, C80, C81, R105, R106, R108, C77, C78, L35 and other components associated with V18.

DRIVE LINES

Check by substitution V18, V19 and V20. Check C79, C80, C81, R105, R106, R108, T2, T4A, C84, C85 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V19 and V20. Check C82, C84, C85, T2, T4A, R111, R112 and other components associated with the horizontal output and damper stages.

FOLDS

Check by substitution V18, V19 and V20. Check T2, T4A and other associated circuit components.

XMAS TREE EFFECT

Check by substitution V17 and V18. Check L35, C76, C77, C78, C79 and other associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V15,and V16. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check R90, R95, T3, T4B, and other associated circuit components.	Check C63, C65, C66 and other associated circuit components.

INSUFFICIENT SWEEP

Check by substitution V15 and V16. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V15 and V16. Check C2C, T3, T4B and other associated components.

COMPRESSED AT TOP

Substitute V15 and V16. Check C66, R86, R88, R92, R93 and other associated circuit components.

FOLDS

Check by substitution V15 and V16. Check associated circuit components.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Check by substitution V10 and V14. Check adjustment of fringe lock control. Check components associated with V10 and V14.

CRITICAL HORIZONTAL AND VERTICAL SYNC

Check adjustment of Fringe Lock control and AGC delay control. Check V10 and V14 by substitution. Check associated circuit components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitutionV10, V14 and V15. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check components associated with V15.	Check components associated with V10B.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V17 and V18. Check waveform W13.

If Satisfactory	If Unsatisfactory
Check components associated with V17 and V18 especially C71, C72, C76 and C77.	Check C69 and R97.

HORIZONTAL BENDING

Substitute V18 and V19. Check C73 and C74. Check horizontal for 60 cycle modulation at W17.

VIDEO

LOSS OF VIDEO

Check C48, R55, picture tube and other associated components.

SOUND BARS (4.5MC BEAT)

Check "Bulls Eye" adjustment in tuner. Check adjustments A29 and A30. Check video IF alignment.

NEGATIVE PIX

Check adjustment of AGC delay control. Check by substitution V9 and V10. Check video detector crystal and assembly. Check components associated with V9 and V10A. Check picture tube and associated components.

POOR CONTRAST (STRONG SIGNAL AREAS)

Check by substitution V6, V7, V8 and V9. Check associated circuit components. Check picture tube.

SMEAR

Substitute V9. Check adjustme nt of AGC delay control. Check R49, R50, R53, R54, R55, R8, C48, picture tube, L29 and other associated components.

WIDE BLACK BAR ACROSS PIX

Check V4, V5, V6, V7 V8 and V9 for heater to cathode leakage. In case of UHF check V1, V2 and V3 for heater to cathode leakage also.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12 and V13. Check components associated with V13 expecially C56, T7, speaker and R72. Check audio IF and detector alignment and components.

BUZZ

Adjust buzz control for minimum buzz. If buzz is still objectionable realigh audio IF and detector stages. Follow procedure outlined in the alignment section.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments light, check V23 and V24. Check B+ filter and decoupling components. If filaments fail to light, check AC interlock assembly, switch on volume control and T1.

SMALL AND/OR DIM PIX

Substitute V23 and V24. Check B+ filter and decoupling components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by substitution V18, V19, V20, V21 and V22. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check C88, C89, R116, R117, R118, T2, T4A and other associated components.	Check C79, C80, C81, R106, R108 and other associated components.

INSUFFICIENT HIGH VOLTAGE"

Check by substitution V18, V19, V20, V21, V22, V23 and V24. Proceed as outlined under " Loss of High Voltage".

BLOOMING

Substitute V21, V20, V19 and V18. Check R116, R117, R118, C88, C89, T2, T4A, picture tube and other associated components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V4, V5, V6, V7, V8 and V9. Check associated components. In case of UHF check V1, V2 and V3.

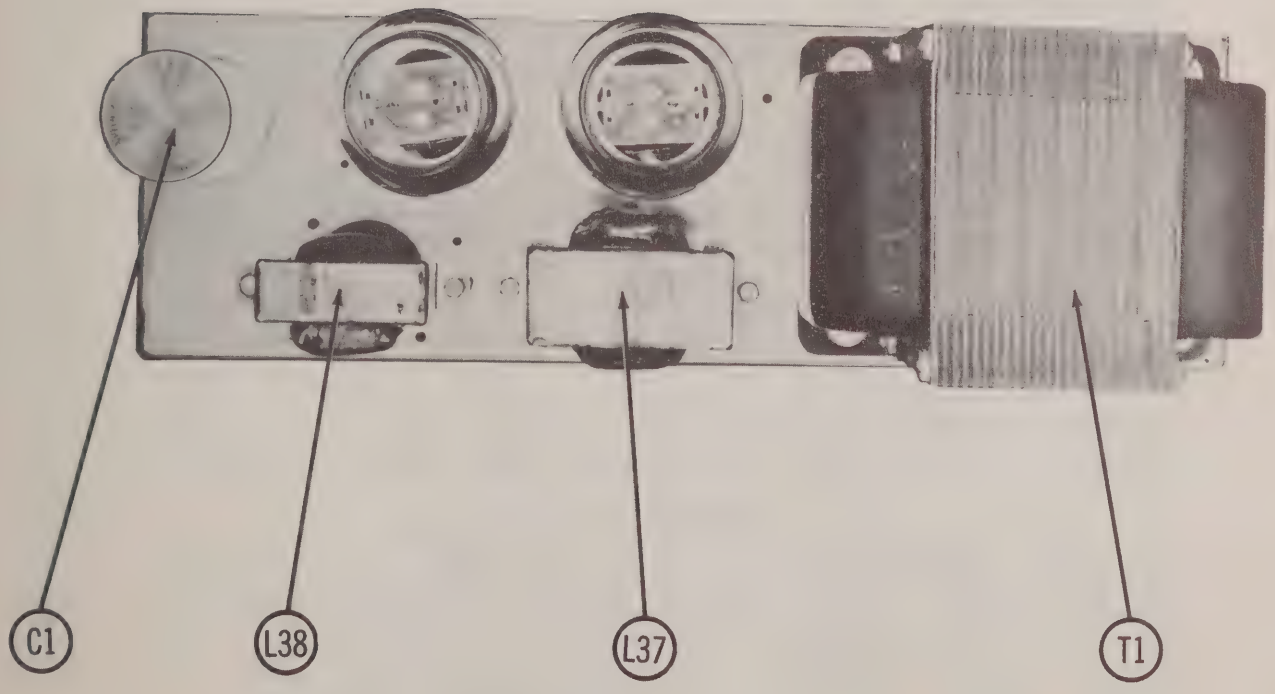
NO RASTER NO SOUND

See "Dead Set".

INTERMITTENT STREAKS

Check video at W2 for interference pulses. Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.



POWER CHASSIS - TOP VIEW

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V26A	RF Amplifier	6BA6	6BA6	7BK	
B	RF Amplifier	6BJ6	6BJ6	7CM	
V27	Converter	12AT7	12AT7	9A	
V28	1st FM AM IF Amp	6BA6	6BA6	7BK	
V29	2nd. FMAM IF Amp.	6BA6	6BA6	7BK	
V30	Limiter	6AU6	6AU6	7BK	
V31	Discriminator-AM Detector-AVC AF Amplifier	6T8	6T8	9E	
V32	Phase Inverter	6C4	6C4	6BG	
V33	Audio Output	6V6GT	6V6GT	7S	
V34	Audio Output	6V6GT	6V6GT	7S	
V35	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C91A	▲40	450	22-1612	AFH2-57		BO45		FP238	TVL-2764	
B	▲40	450								
C92A	▲40	450	22-2243	AFH2-56		BO44		FP376.5	TVL-3780	
B	▲20	350								
C93	15		22-2140	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C94	15		22-2140	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C95	110		22-5	SI110						
C96	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C97	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C98	110		22-5	SI110						
C99	22		22-1506	SI22N080			N080-331-220			
C100	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C101	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C102	1		22-1762	SI1NP0	TCZ-1		NP0K-010		5TCCB-V1	
C103	50		22-1367	SI50NP0	TCZ-50		NP0K-500	ZT-545	5TCC-Q5	
C104	22		22-1506							
C105	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C106	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C107	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C108	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C109	.002	600	22-1220	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C110	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C111	.002	600	22-492	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C112	.005	600	22-1135	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C113	.002	600	22-1220	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C114	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C115	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C116	25		22-1887	SI25	D6-250		GP1K-250	UC-5425	5GA-Q25	
C117	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C118	750		22-1962	SI750	D6-751		GP2K-751		5GA-T75	
C119	200		22-1668	SI200	D6-201		GP2K-201	UC-532	5GA-T2	
C120	110		22-5	SI110						
C121	110		22-5	SI110						
C122	.02	600	22-830	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C123	15		22-2140	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C124	.3	200	22-2493					TP444		
C125	.02	400	22-1127	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C126	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C127	330		22-2309	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C128	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C129	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C130	100	500	22-365	1468-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-S1	
C131	.1	600	22-417	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C132	.1	600	22-417	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C133	.01	1200	22-455	P1688-01		PTE16S1		PT1611	MB-S1	
C134	.0005	1600	22-2493	2584-0005					MB-T5	
C135	.0047	600	22-1782	P688-0047		PTE6D47		PT6247	6TM-D47	
C136A	10000		22-2276	BPD-2X01	DD3-103	TM5DS1	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C137A	10000		22-2276	BPD-2X01	DD3-103	TM5DS1	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C138	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R124A	1.5Meg	½	63-2891	Q18-139X		ABT-82		Volume tapped at 800K
B	Shaft		Not Req.	76-1		AK-4		Attach to R124A
R125A	10KΩ	½	63-2892	Q13-116	AG-81-Z	AB-15	U-18	Bass
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R125A
R126A	1Meg	½	63-2893	Q13-137	AG-63-Z	AB-70	U-53	Treble
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R126A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R127	1Meg	½	63-1912	BTS-1Meg	
R128	33Ω	½	63-1723	BTS-33	
R129	2.2Meg	½	63-1926	BTS-2.2Meg	
R130	220Ω	½	63-1758	BTS-220	
R131	220Ω	½	63-1758	BTS-220	
R132	10KΩ	½	63-1827	BTS-10K	
R133	2.2Meg	½	63-1926	BTS-2.2Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R134	220Ω	½		BTS-220	
R135	470Ω	½	63-1772	BTS-470	
R136	2.2Meg	½		BTS-2.2Meg	
R137	1000Ω	½	63-1786	BTS-1000	
R138	22Ω	½	63-1716	BTS-22	
R139	1000Ω	½	63-1786	BTS-1000	
R140	6800Ω	½	63-1820	BTS-6800	

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R141	22KΩ	½	63-1841	BTS-22K	
R142	2. 2Meg	½	63-1926	BTS-2. 2Meg	
R143	68Ω	½	63-1737	BTS-68	
R144	1500Ω	½	63-1793	BTS-1500	
R145	6800Ω	2		BTB-6800	
R146	100Ω	½	63-1744	BTS-100	
R147	820Ω	½	63-2091		
R148	100KΩ	½	63-1870	BTS-100K	
R149	27KΩ	½	63-1845	BTS-27K	
R150	22KΩ	½	63-1842	BTS-22K	
R151	22KΩ	½	63-1842	BTS-22K	
R152	220KΩ	½	63-1884	BTS-220K	
R153	100KΩ	½	63-1869	BTS-100K	
R154	150KΩ	½	63-1876	BTS-150K	
R155	150KΩ	½	63-1876	BTS-150K	
R156	4. 7Meg	½	63-1940	BTS-4. 7Meg	
R157	220KΩ	½		BTS-220K	
R158	1200Ω	½	63-1789	BTS-1200	
R159	470Ω	½	63-1771	BTS-470	
R160	680Ω	½	63-1778	BTS-680	
R161	390KΩ	½	63-1894	BTS-390K	
R162	470KΩ	½	63-1898	BTS-470K	
R163	2200Ω	½	63-1799	BTS-2200	
R164	47KΩ	½	63-1856	BTS-47K	
R165	270KΩ	½	63-1887	BTS-270K	
R166	270Ω	2	63-1452		
R167A	1000Ω		63-2864		
B	4000Ω				
R168	2700Ω	2	63-2297	BTB-2700	
R169	10KΩ	½	63-1827	BTS-10K	
R170	130Ω	5	63-2142		
R171	470KΩ	½	63-1898	BTS-470K	
R172	390KΩ	½	63-1894	BTS-390K	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T8	117VAC @.89A	686VCT .120ADC	5VAC @2A	6.3VAC @3.4A	95-1253				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T9	9.8Ω CT	3.6Ω	700Ω CT	.5Ω	95-1355	A-2936①	A-3849①	RO-110 ①	S-15X ①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L39	FM Ant. Coil	0Ω		S-16408				
L40	Fil. Choke	.7Ω		S-13997			4612	9. 5Microhenries
L41	FM RF Coil	0Ω	0Ω	S-15743				
L42	FM Osc. Coil	0Ω	0Ω	S-15691				
L43	AM Loop Ant.	0Ω		S-17917				
L44	Ant. Loading Coil	3. 4Ω		S-18812	19-3250	TV-185	4646	223 Microhenries
L45	RF Choke	0Ω		20-337			4608	5 Microhenries
L46	AM RF Coil	2. 4Ω	11Ω	S-16344				Secondary tapped @ 3. 1Ω
L47	AM Osc. Coil	1. 1Ω	8. 5Ω	S-16345				Secondary tapped @ 3. 4Ω; pickup winding=1. 2Ω.
L48	1st FM IF	. 4Ω	. 4Ω	95-1201	16-6665 *	FM-251	1451	
L49	1st Am IF	16Ω	16Ω	95-1248				Primary tapped @ 4. 4Ω
L50	RF Choke	0Ω		20-337			4608	5 Microhenries
L51	2nd FM IF	. 4Ω	. 4Ω	95-1150	16-3487 †	FM-251	1451	
L52	2nd AM IF	16Ω	16Ω	95-1249				Tertiary winding=. 4Ω
L53	3rd FM IF	. 4Ω	. 4Ω	95-1150	16-3487 †	FM-251 ▲	1451 ▲	
L54	3rd AM IF	16Ω	10Ω	95-1254	16-5742 ▲	BC-340 ▲	912-C4 ▲	
L55	FM Discrim.	. 4Ω	. 4Ω	95-1153	17-3484 ■	FM-250 ▲	1452 ▲	
L56	AM Audio Coupling	0Ω		20-337			4608	5 Microhenries
L57	FM Audio Coupling	0Ω		20-337			4608	5 Microhenries
L58	RF Choke	0Ω		20-337			4608	5 Microhenries
L59	RF Choke	0Ω		20-337			4608	5 Microhenries
L60	RF Choke	0Ω		20-337			4608	5 Microhenries
L61	Line Choke	0Ω		20-337			4608	5 Microhenries

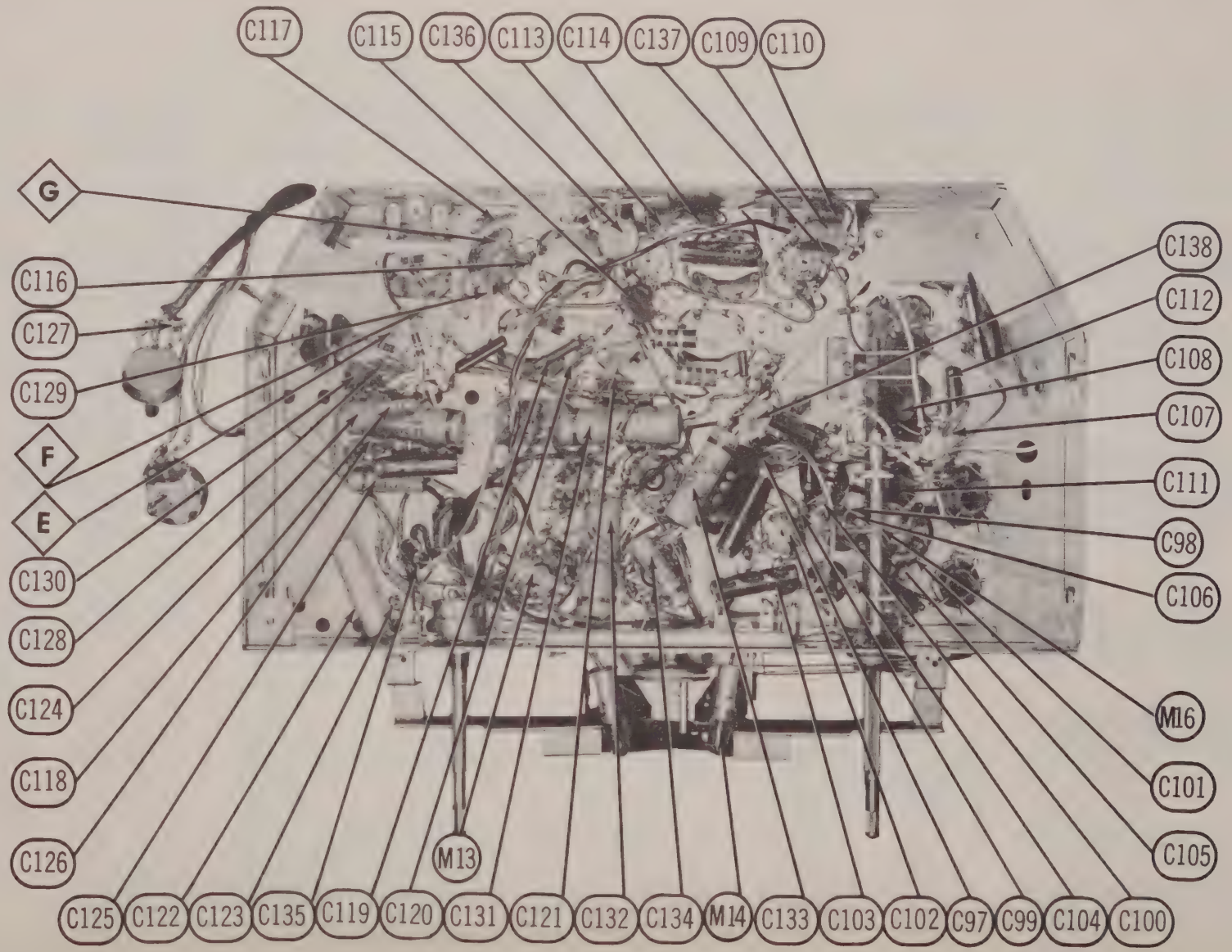
* Drill new mounting holes.
† Remove center spade bolt mounting support and use adaptor plate.
▲ Remove center spade bolt mounting support.
■ Add diode filter cap. externally, drill new mounting holes, and remove center spade bolt mounting support.
▲ Add diode filter cap externally and remove center spade bolt mounting support.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M13	3AG P/T	2A	36-24		318002 (3AG P/T-2A)		GJV 2	

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M14	Dial Light	100-67	(2) #47
M15	Tuning Cap	22-2400	3 gang (18-370MMF, 11-200MMF, 11-85MMF)
M16	Switch	85-531	Function selector-rotary
M17	Switch	85-505	AM-FM antenna selector-ganged with M15 (slidetype)
	Knob	S-19316	(2) dummy & volume
	Knob	46-1041	Tuning
	Knob	46-1043	Function switch
	Knob	46-1153	(2) Tone
	Dial glass	192-138	



RADIO CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

PROPERTY OF
L. F. BLANKENSHIP
3921 MILLS ST.
DENVER, COLORADO

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	1st UHF IF Amplifier	6BK7A	6BK7A	9AJ	
V3	2nd UHF IF Amp.	6AU6	6AU6	7BK	
V4	RF Amplifier	6BK7A	6BK7A	9AJ	
V5	Converter	6U8	6U8	9AE	
V6	1st Video IF Amp.	6CB6	6CB6	7CM	
V7	2nd Video IF Amp.	6CB6	6CB6	7CM	
V8	3rd Video IF Amp.	6CB6	6CB6	7CM	
V9	Video Output	12BY7	12BY7	9BF	
V10	AGC Keying Vert. Sync Det.	12AX7	12AX7	9A	
V11	Sound IF Amp.	6AU6	6AU6	7BK	
V12	Audio Detector	6BN6	6BN6	7DF	
V13	Audio Output	6BK5	6BK5	9BQ	
V14	Sync Separator	6BE6	6BE6	7CH	
V15	Vert. Mult	6SN7GTA	6SN7GTA	8BD	
V16	Vert. Output	6AV5GT	6AV5GT	6CK	
V17	Horiz. Phase Det. Horiz. AFC	6AQ7GT	6AQ7GT	8CK	
V18	Horiz. Oscillator Horiz. Discharge	6SN7GTA	6SN7GTA	8BD	
V19	Horiz. Output	6CD6G	6CD6G	5BT	
V20A	Damper	6AX4GT	6ASXGT	4CG	
B	Damper	6AS4GT	6AS4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	HV Rectifier	1X2A	1X2A	9Y	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V25A	24CP4A	24CP4A 24CP4 ①	24CP4A	12D	① Circuit changes necessary.
B	24TP4			12D	
C	27EP4	27EP4 27GP4	27EP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	400	22-2487	AFH4-79		BO45		FP447	TVL-3786	
B	■40	450				BR2045				
C	▬20	450								Note 1
C2A	▬40	450	22-2483	AFH4-83		CO32		FP396.2	TVL-3762	
B	▲10	400				BRH501		TC3501	TVA-1705	
C	100	50								
D	■10	450								
C3A	■4	350	22-2478	E3C466		BO07			TVL-3603	
B	▲100	25				BR435				
C	40	25								
C4A	▲30	400	22-2437	AFH3-46		BO48		FP377	TVL-4670	
B	■40	400				BR3045		TC77		Note 2
C	▬80	400								Note 3
C5	4		22-2454							
C6	47		22-1667							
C7	400		22-2404							
C8	400		22-2404							
C9	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C10	400		22-2404							
C11	400		22-2404							
C12	27		22-2509							
C13	800		22-2331	BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C14	1.2-3.5		22-2405							
C15	400		22-2404							
C16	800		22-2331	BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C17	400		22-2503							
C18	800		22-2331	BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C19	400		22-2404							
C20	1.8		22-2428							
C21	400		22-2404							
C22	470		22-2302	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C23	400		22-2404							
C24	800		22-2331	BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C25	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C26	470		22-2217	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C27	5									Note 4
C28	6		22-2381							
C29	8									Note 5
C30	24									Note 3
C31	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-S1	
C32	.47	200	22-2146	P288-5		PJ2P5		PT405	2TM-P47	
C33	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C34	330		22-2309	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C35	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C36	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C37	470		22-2302	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C38	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C39	470		22-6	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C40	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C41	560		22-2310	SI560	D6-561		GP2K-561		5GA-T56	
C42	470		22-2217	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C43	4.5		22-2383							
C44	7		22-2375							
C45	270		22-2477	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C46	47		22-2467	SI47N080						

PROPERTY OF
L. F. BLANKENSHIP
3004 WEBB ST.
DENVER, COLORADO

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No	RATING CAP.	RATING VOLT	REPLACEMENT DATA ZENITH PART No	AEROVOX PART No.	CENTRALAB PART No	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C47	47		22-2325							
C48	.1	200	22-1777	P288-1	DF-104	PJF2P1		PT401	2TM-P1	
C49	2000		22-8	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	
C50	3.3		22-2343	S13.3NP0	TCZ-3.3		NP09C-3R3		STCCB-V33	
C51	50		22-2460	S150	D6-500	TM5Q5	GP1K-500	UC-546	5GA-Q5	
C52	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C53	.047	200	22-1778	P288-047	DF-503	PTE6S47		PT6147	4TM-S47	
C54	10		22-2378							
C55A	10000	}	22-2276	BPD-2X01	DD3-103	TM6DS1	{ 81-01	DC-511	5HK-2S1	
B	10000						{ 81-01	DC-511		
C56	10000		22-3	BPD-01	DD-103	TM3S1	81-01	DC-511	5HK-S1	
C57	680		22-2320	S1680	D6-681		GP2K-681	UC-5368	5GA-T68	
C58	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	UC-524	5HK-D4	
C59	.0068	1000		P1088-0068		PTE16D68		PT6238	MB-D68	
C60	10000		22-3	BPD-01	DD-103	TM3S1	81-01	DC-511	5HK-S1	
C61	470		22-2302	S2470	D6-471		GP2K-471	UC-5347	5GA-T47	
C62	.0047	400	22-1847	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C63	.0047	600	22-1849							
C64	.1	200	22-1777	P288-1	DF-104	PJF2P1		PT401	2TM-P1	
C65	.047	600	22-1844	P688-047		PTE6S47		PT6147	6TM-S47	
C66	.1	600	22-1841	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C67	.1	200	22-1777	P288-1	DF-104	PJF2P1		PT401	2TM-P1	
C68	.0033	600	22-2246	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D33	
C69	100	500	22-1444	1469-0001		SR5T1			MS-S1	
C70	120	500	22-2505							
C71	.001	600	22-2127	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C72	.0047	400	22-1843							
C73	.15	200	22-2166							
C74	.001	600	22-2127	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C75	.1	200	22-1777	P288-1	DF-104	PJF2P1		PT401	2TM-P1	
C76	680	500	22-2125	1479-0007		SR5T7			MS-37	
C77	.0015	400	22-1785	P688-0015		PTE6D15		PT6215	6TM-D15	
C78	1100	500	22-2416			SR5T1				
C79	1000		22-2112	S1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C80	680		22-2387	1479-0007		SR5T7			MS-37	
C81	330		22-2309	S1330	D6-331		GP2K-331	UC-5333	5GA-T33	
C82	.047	600	22-1775	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C83	.22	200	22-2187	P488-25		PTE4P32		PT4025	4TM-P32	
C84	.15	400	22-2341	P488-15		PTE4P15		PT4015	4TM-P15	
C85	.1	400	22-2340	P488-1		PTE4P1		PT401	4TM-P1	
C86	.0068	600		P688-0068		PTE6D68		PT6268	6TM-D68	Note 6
C87	.0033	400	22-2326	P688-0033		PTE6D33		PT6233	6TM-D33	
C88	500	20000	22-1832	HV20C	TV3-502	MMC-20TS	413-501	HV20035A	20DK-T5	
C89	500	20000	22-1822	HV20C	TV3-502	MMC-20TS	413-501	HV20035A	20DK-T5	
C90	82	2000		HV20C				HV20035A	20GA-Q83	

Note 1. Some Models use 40MFD in this application.
Note 2. Some Models use 4MFD in this application.
Note 3. Not used in all Models.
Note 4. Some Models use 7MMF in this application.
Note 5. Some Models use 9MMF in this application.
Note 6. Some Models use .0047MFD in this application (part #22-1849)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	63-2838	Q13-133	AG-60-Z	AB-60	U-48	Volume
B	Shaft		Not Req.	C3	K8S-3	AK-4	D8-S6	Attach to R1A
C	Switch		Not Req.	T6-1	SWB	KB-1	US-26	Attach to R1A
R2A	1Meg	½	63-2835	Q11-137	AG-61-S	AB-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	K8S-3	AK-4	Not Req.	Attach to R2A
R3A	7.5Meg	½	63-2805	Q11-142		AB-89	U-82	Height
B	Shaft		Not Req.	RQ		AK-1	Not Req.	Attach to R3A
R4A	200KΩ	½	63-2837	Q11-129	AG-62-S	AB-66	U-43	Brightness
B	Shaft		Not Req.	Not Req.	K8S-3	AK-4	Not Req.	Attach to R4A
R5A	1Meg	½	63-2835	Q11-137	AG-61-S	AB-69	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	K8S-3	AK-4	Not Req.	Attach to R5A
R6A	150Ω	2	63-2812	WK-1500	A43-1500	VK-130	R1500L	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FK5-1/4	Not Req.	Not Req.	Attach to R6A
R7	4000Ω	1	63-2159		39-4000			AGC Delay
R8A	15KΩ	½	63-2854	Q17-116X				Contrast
B	Shaft		Not Req.	WQ				Attach to R8A
R9	200Ω	½	63-2853	Q11-301				Screen Register
R10	800Ω	1	63-2167		39-800			Buzz
R11A	7.5Meg	½	63-2805	Q11-142		AB-89	U-82	Fringe Lock
B	Shaft		Not Req.	RQ		AK-1	Not Req.	Attach to R11A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ZENITH PART No.	IRC PART No.	NOTES
R12	100KΩ	½	63-1859	BTS-100K	
R13	680KΩ	½	63-1869	BTS-680K	
R14	220Ω	½	63-1758	BTS-220	
R15	3300Ω	½		BTS-3300	
R16	220KΩ	½		BTS-220K	
R17	47Ω	½		BTS-47	
R18	220KΩ	½		BTS-220K	
R19	47KΩ	½		BTS-47K	
R20	68KΩ	½		BTS-68K	
R21	470Ω	½		BTS-470	
R22	82Ω	½		BTS-82	
R23	82KΩ	½		BTS-82K	
R24	470Ω	½		BTS-470	
R25	470Ω	½		BTS-470	
R26	5500Ω	10		1 3/4-5500	Note 1
R27	100KΩ	1		BTA-100K	
R28	10KΩ	2		BTB-10K	
R29	68Ω	½	63-1737	BTS-68	
R30	56Ω	½	63-1733	BTS-56	
R31	2.2Meg	½	63-1328	BTS-2.2Meg	
R32	22KΩ	½	63-1841	BTS-22K	
R33	6800Ω	½	63-1821	BTS-6800	
R34	15Ω	½	63-1706	BTS-15	
R35	470Ω	½	63-1772	BTS-470	
R36	10KΩ	½	63-1827	BTS-10K	
R37	120KΩ	½	63-1873	BTS-120K	
R38	120KΩ	½	63-1873	BTS-120K'	
R39	470Ω	½	63-1772	BTS-470	
R40	220Ω	½	63-1767	BTS-220	
R41	150Ω	½		BTS-150	
R42	220Ω	2	63-1767	BTS-220	
R43	8200Ω	1		BTA-8200	
R44	22KΩ	½	63-1841	BTS-22K	
R45	27Ω	½	63-1719	BTS-27	
R46	10KΩ	2		BTB-10K	
R47	100KΩ	½	63-1869	BTS-100K	
R48	22KΩ	½	63-1841	BTS-22K	
R49	3300Ω	4	63-2899		
R50	3300Ω	4	63-2899		
R51	100KΩ	½	63-1869	BTS-100K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ZENITH PART No.	IRC PART No.	NOTES
R52	10KΩ	½	63-1827	BTS-10K	
R53	2700Ω	½	63-1803	BTS-2700	
R54	1000Ω	½	63-1785	BTS-1000	
R55	220KΩ	½	63-1863	BTS-220K	
R56	220KΩ	½	63-1863	BTS-220K	
R57	100KΩ	½	63-1870	BTS-100K	
R58	4700Ω	½	63-1812	BTS-4700	
R59	2700Ω	½	63-1803	BTS-2700	
R60	470KΩ	½	63-1898	BTS-470K	
R61	680KΩ	½	63-1904	BTS-680K	
R62	100KΩ	2	63-1962	BTS-100K	
R63	100KΩ	½	63-1869	BTS-100K	
R64	100KΩ	1	63-2781	BTA-100K	
R65	33KΩ	2	63-3180	BTB-33K	
R66	220KΩ	½	63-1883	BTS-220K	
R67	680Ω	½	63-1779	BTS-680	
R68	330KΩ	½	63-1890	BTS-330K	
R69	100Ω	½	63-1786	BTS-100	
R70	100Ω	½	63-1743	BTS-100	
R71	10KΩ	½	63-1828	BTS-10K	Note 3
R72	470Ω	1	63-2398	BTA-470	
R73	680KΩ	½	63-1904	BTS-680K	
R74	1.5Meg	½	63-1918	BTS-1.5Meg	
R75	47KΩ	2	63-1157	BTB-47K	
R76	680KΩ	½	63-1904	BTS-680K	
R77	100KΩ	½	63-1869	BTS-100K	
R78	47KΩ	½	63-1865	BTS-47K	
R79	15KΩ			BTS-15K	
R80	1200Ω	½	63-1789	BTS-1200	
R81	22KΩ	½	63-1842	BTS-22K	
R82	1000Ω	½	63-1785	BTS-1000	
R83	100KΩ	½	63-1869	BTS-100K	
R84	680KΩ	½	63-1905	BTS-680K	
R85	100KΩ	½	63-1869	BTS-100K	
R86	270KΩ	½		BTS-270K	
R87	100Ω	½	63-1744	BTS-100	
R88	2.2Meg	½		BTS-2.2Meg	
R89	330Ω	1		BTA-330	
R90	100Ω	½	63-1744	BTS-100	
R91	27KΩ	1	63-1192	BTA-27K	
R92	10Meg	½		BTS-10Meg	Note 3
R93	4.7Meg	½		BTS-4.7Meg	Note 3
R94	47KΩ	1	63-1194	BTA-47K	
R95	330Ω	1	63-2286	BTA-330	
R96	1Meg	½	63-1911	BTS-1Meg	
R97	1Meg	½	63-1911	BTS-1Meg	
R98	1Meg	½	63-1911	BTS-1Meg	
R99	27KΩ	½		BTS-27K	
R100	100Ω	½	63-1744	BTS-100	
R101	470Ω	½	63-1771	BTS-470	
R102	47KΩ	1	63-1194	BTA-47K	
R103	22KΩ	½	63-1842	BTS-22K	
R104	10KΩ	2	63-2145	BTB-10K	
R105	47KΩ	½	63-1856	BTS-47K	
R106	320KΩ	2	63-3166	BTB-320K	
R107	100Ω	½	63-1744	BTS-100	
R108	1Meg	½	63-1912	BTS-1Meg	
R109	15KΩ	½	63-1834	BTS-15K	
R110	47Ω	2	63-1983		
R111	33KΩ	2	63-1543	BTB-33K	
R112	33KΩ	2	63-1543	BTB-33K	
R113	33KΩ	1		BTA-33K	
R114	4700Ω	2	63-966	BTB-4700	
R115	4700Ω	2	63-966	BTB-4700	
R116	8.2Ω	½	63-2894		
R117	8.2Ω	½	63-2894		
R118	2.1Meg	2	63-2816		
R119	330Ω	½	63-1784	BTS-330	
R120	330Ω	½	63-1784	BTS-330	
R121	100KΩ	½	63-1870	BTS-100K	
R122	330Ω	1	63-3162	BTA-330	
R123	8.2Ω	2	63-2898		

Note 1. Some models may use a 6800Ω resistor in this application.
Note 2. Used in combination sets only.
Note 3. Some models may use a single 15 Meg 1 Watt resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ⑤3.42A	684VCT .180ADC tap ⑥ 520VCT .148ADC	5VAC ⑤3A	6VAC ⑤2A SEC. 4 12.6VCT ⑤4A	95-1353	PC-8410 ①		PV-120A		

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	319.5Ω tap ⑥ 8.9Ω, 24.5Ω tap ⑥ 14.5Ω, 22.5Ω	15Ω SEC. 2 0Ω SEC. 3 0Ω	S20099 S-30195 ⑦						Horiz. Output Trans.
T3	240Ω tap ⑥ 14.5Ω, 22.5Ω		95-1352	A-8113⑦ ②		T8O-13①			Vert. Output Trans.
T4A	15.5Ω		95-1359		MDF-90			219D1⑧	Horiz. Deflection Coils
B	41.5Ω								Vert. Deflection Coils
T5	6.5Ω		S-19342	WC-2⑤④	MWC-2	TW-5 ④	WC-12④ ⑤	207R1③④	Horiz. Linearity Coil
T6	20.5Ω	4.7Ω	S-19748						Width

① Drill one new mounting hole.
⑦ Connect blue lead to plate and red lead to point of original B+. Tie green lead of transformer to white lead of yoke and connect to chassis ground. Tie white lead of transformer to red lead of yoke and connect to vertical blanking circuit.
① Do not use tap.
④ Drill new mounting hole.
⑤ Connect to coded blue and green terminals.
⑧ Use original deflection coil network and leads.
⑦ Winding only for horizontal output transformer

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T7	6.8KΩ	3.6Ω	600Ω	.6Ω	95-1339	A-3870 ①	A-3020	RO-9 ①	S-5Z	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	12"	PM	3.6Ω	49-740	12J11	12A6A	① Used in Models L2572R, L2573E, L2574R, L2575E and 2578R
B	10"	PM	3.6Ω	49-738 ① 49-649 ② 49-743 ③	10J11	10A4A	② Alternate 10" PM speaker ③ 10" PM speaker used in Models 2876E, 2876R, 2878E and 2878R

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	REPLACEMENT DATA ZENITH PART No	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil Primary	0Ω CT		S-19683				
L2	UHF Ant. Coil Secondary	0Ω	0Ω	20-426				
L3	UHF Mixer Coils	0Ω		20-426				
L4	Osc. coupling	0Ω		20-468				
L5	UHF Osc. Coil	0Ω		20-426				
L6	Fil. Choke	0Ω		20-425				
L7	Fil. Choke	0Ω						
L8	Fil. Choke	0Ω						
L9	Cathode Choke	0Ω		20-423				
L10	RF Choke	0Ω		20-425				
L11	RF Choke	0Ω		20-425				
L12	UHF IF Coupling	.5Ω		S-20535				
L13	Neutr. Coil	2.4Ω		S-19541				
L14	RF Choke	.4Ω		S-20607				
L15	Grid Choke	.4Ω		S-20610				Wound on resistor.
L16	UHF IF Output Coil	.2Ω		S-30808				Wound on resistor. Tapped ⑥ 0Ω
L17	Fil. Choke	0Ω		20-391				
L18	41.25MC trap	0Ω		S-19958				Includes core; core part # 149-111
L19	47.25MC trap	0Ω		S-18210				Includes core; core part # 149-111
L20	39.75MC trap	0Ω		S-20290				Includes core; core part # 149-111
L21	1st Video IF	0Ω		S-19736			6234	Includes core; core part # 149-111
L22	2nd Video IF	0Ω	0Ω	S-17907			6232 ■	Includes core; core part # 149-110
L23	3rd Video IF	0Ω	0Ω	S-19952			6233 ■	Includes core; core part # 149-110
L24	4th Video IF	.3Ω	.3Ω					Video Det. assembly (part # S-19956)-Includes 1N64 crystal detector, C43, C44, L24, L25 & L26.
L25	Series Peak. Coil	8Ω		S-19954	19-3180		4644	144 Microhenries
L26	Shunt. Peak. Coil	8Ω		S-19953	19-3160 ▲	TV-184 ▲	4644 ▲	160 Microhenries; wound on 27000 resistor in series.
L27	Series Peak. Coil	1.5Ω		S-15128			4612	12 Microhenries
L28	Cathode Choke	1.8Ω		S-19969	19-3036	TV-180	6176	30 Microhenries
L29	Series Peak. Coil	7.5Ω		S-20021	19-4200	TV-184 *	6154 *	210 Microhenries; wound on 15KΩ resistor.
L30	Shunt. Peak. Coil	13Ω		S-17958	19-3500	TV-188	6174	481 Microhenries
L31	1st Sound IF	1.9Ω	3.1Ω	S-19959				Includes core; core part # 149-85
L32	Fil. Choke	.1Ω		S-16984			4612	6.8 Microhenries
L33	2nd Sound IF	.3Ω	.3Ω	S-20219	19-3445			Includes core; core part # 149-56
L34	Quadrature Coil	4.4Ω		S-19001	20-1005			Includes core; core part # 149-110
L35	Horiz. Osc.	180Ω		S-19743	19-1577			Includes core; core part # 149-31 Tapped ⑥ 60Ω
L36	Anti-Ringing Coil	8.5Ω		S-20438	19-3180 †	TV-184 †	6154 †	205 Microhenries; wound on 47Ω resistor.

* Parallel with 15KΩ resistor.
■ Detune trap.
▲ Add 2700Ω resistor in series.
† Parallel with 470 Ω resistor

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No	CHICAGO PART No	TRIAD PART No
L37	.180ADC	100Ω	3.1 Hy.	95-1334	C-2325 ①		TR-4200①	C-15X
L38	.148ADC	200Ω	3.5 Hy.	95-1170	C-2304 ①			

① Drill one new mounting hole.

FUSES

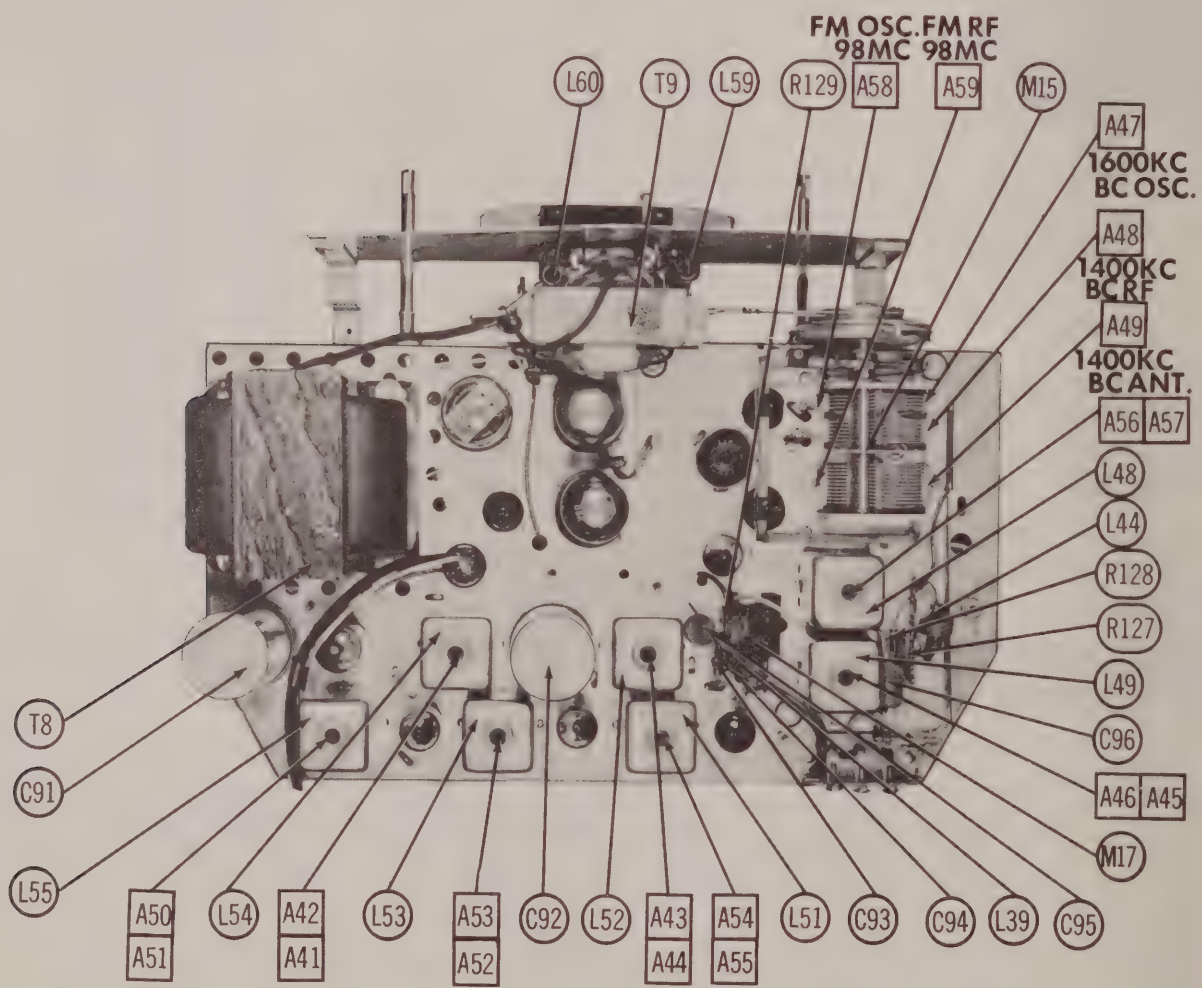
ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG 8/B1/4A		136-22	83-1883	313.250 (3AG 8/B-1/4A)	357001	MDL 1/4	4405

ZENITH MODELS L2571R, U, L2572R, U, L2573E, U, L2574R, U, L2575E, U, L2592R, U, L2593H, U, L2876E, R, U, L2878R, U, L2879E, U, L2894HU (Ch. 22L20 & Radio Ch. 10L20)

TV PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2	Dial Light	100-166	UHF indicator #47
M3	Dial Light	100-166	VHF indicator #47
M4	UHF Tuner	S19670	
M5	VHF Tuner	S19970	
M6	Crystal	103-1	Video detector 1N64
M7	Crystal		CK710-UHF, mixer
M8	Switch		UHF-VHF changeover switch-2 used (d. p. d. t. slide type)
M9	Focus Magnet	S-20344	Includes focus adjustment and centering lever
M10	Ion Trap	S-17461	
M11	Correction Magnet	S-20360	2used
M12	Dial Light	100-166	Jewel-not used in all models.
B1	Trimmer Cap	22-2398	Horiz. Drive
	Cabinet	14-1618R	Model L2571RU
	Cabinet	14-1599R	Model L2572RU
	Cabinet	14-1600E	Model L2573EU
	Cabinet	14-1601R	Model L2574RU
	Cabinet	14-1602E	Model L2575EU
	Cabinet	14-1603R	Model L2592RU
	Cabinet	14-1604H	Model L2593HU
	Cabinet	14-1605E	Model L2876EU
	Cabinet	14-1605R	Model L2876RU
	Cabinet	14-1606R	Model L2878RU
	Cabinet	14-1607E	Model L2879EU
			Model L2894HU
	Knob	46-1005	(3) Brightness - Vert. Hold - screen
	Knob	S19072	Control cover and emblem
	Knob	46-1052	Fine Tuning
	Knob	46-1118	Horiz. Hold
	Knob	46-1182	Tone
	Knob	S-20277	Channel Selector
	Knob	46-1196	Volume
	Knob	46-1199	Contrast
	Safety Glass	192-169	Model L2571R
	Safety Glass	192-166	Model L2572R, 73E, 74R, 75E, 92R, 93H
	Safety Glass	192-167	Model L2876E, 76R, 78R, 79E
	Control cover	24-656	



RADIO CHASSIS TOP VIEW

PROPERTY OF
L. F. BLANKENSHIP
3001 MEADE ST.
DENVER, COLORADO

RADIO CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the RF tuner oscillator circuit remove rear cover and supply power to set. Adjustments are made through the hole marked "Bull's Eye" adjustment and are accessible one at a time as the selector switch is turned (fine tuning control must be at the center of its range before making adjustment). Use alignment wrench #68-21 for adjusting.

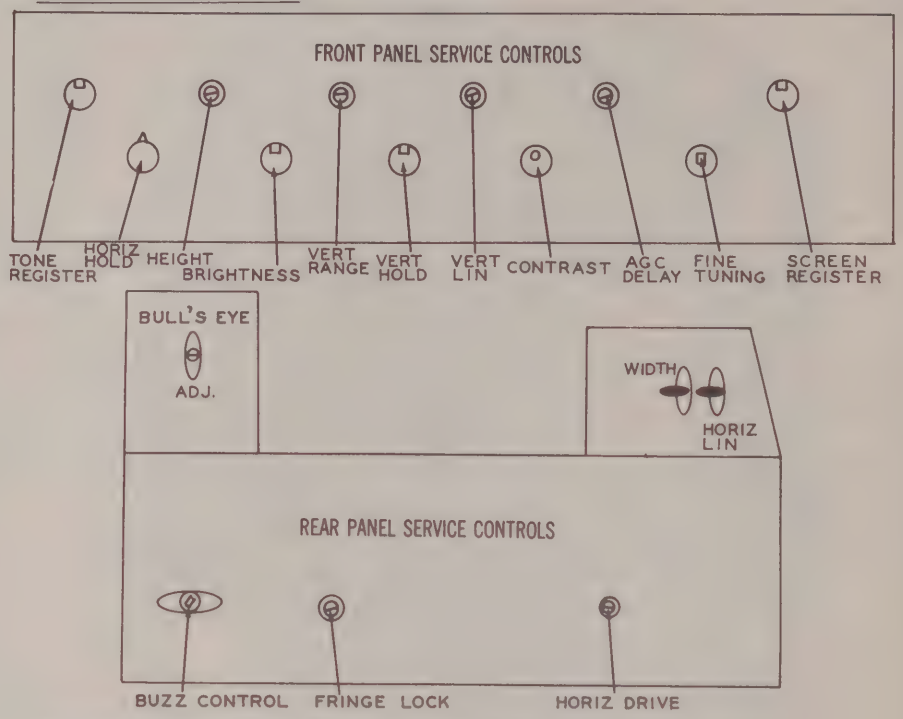
PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws holding wood strip at top of safety glass. Remove wood strip and tilt safety glass out from top and remove.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - FRINGE LOCK ADJUSTMENT

Turn the fringe lock control to 1/4 turn from full clockwise position. Adjust the vertical and horizontal hold for picture synchronization and check stability by switching off channel and back again. Slightly, retouch the fringe lock control adjustment, if necessary, for maximum stability while testing above.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the front panel service controls. Adjust the horizontal hold control (L35) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control located on rear apron of chassis for maximum volume and minimum buzz. If results are unsatisfactory see alignment instructions on pages 6 and 7.

FUSES

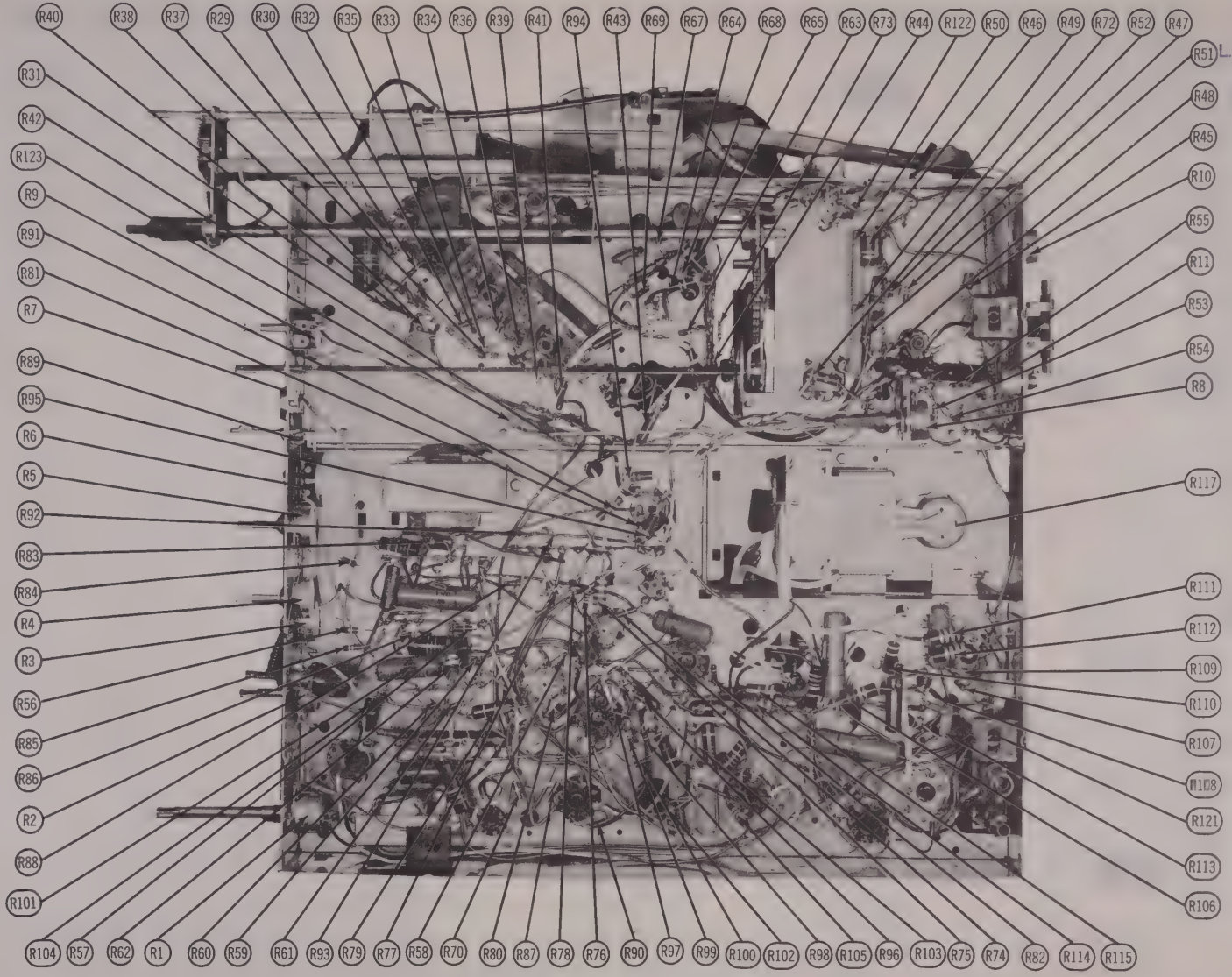
One fuse is used for horizontal sweep circuit protection. (See tube placement chart for location). (Models using radio have fused radio power supply).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

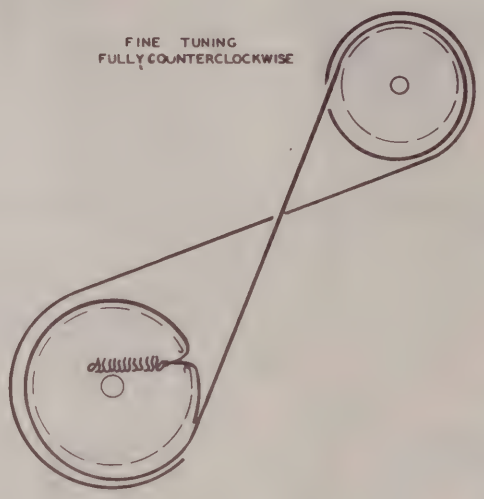
ANTI-PIN CUSHION ADJUSTMENT

Adjust the vertical height and horizontal width controls so that the corners and sides of the picture are visible. Bend the corrector magnets arms for right angle corners and until opposite sides of the picture are parallel and straight. Restore picture to normal size.

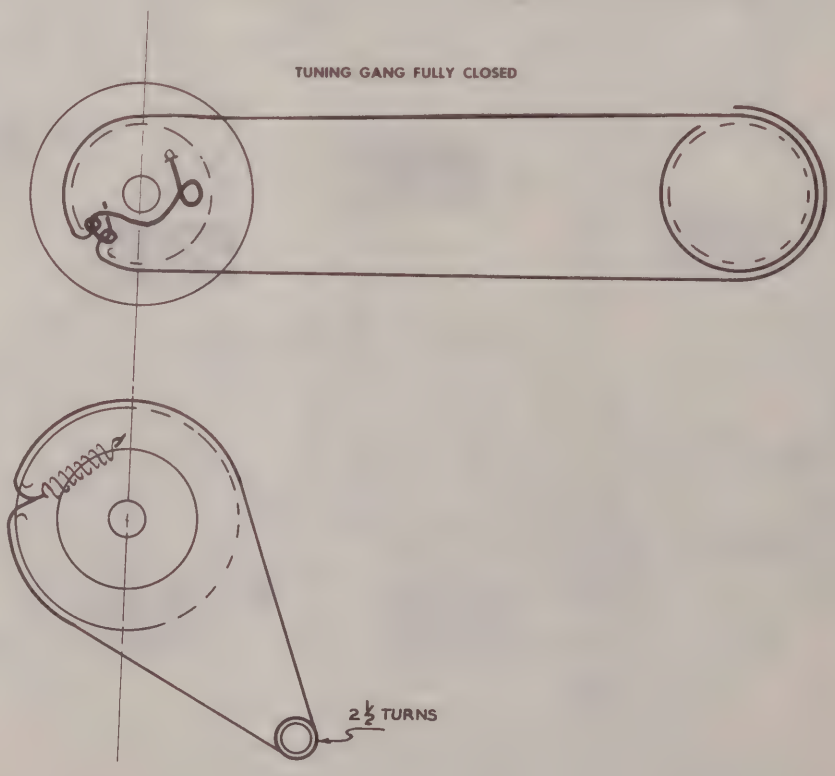


TV CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION

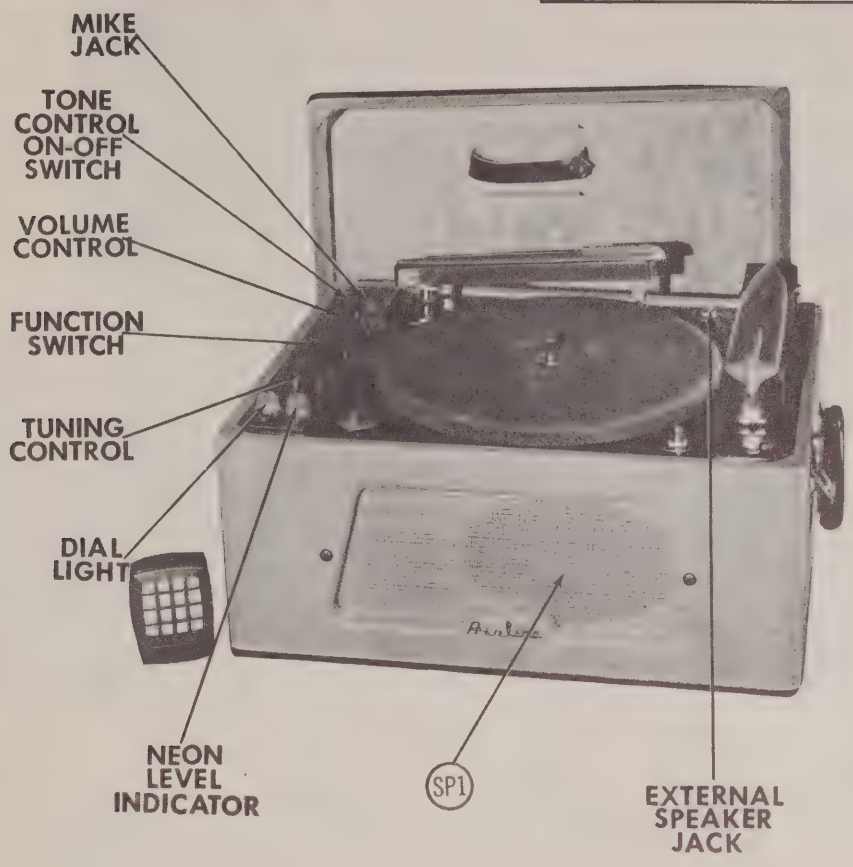
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO



TV DRIVE CORD STRINGING



RADIO DRIVE CORD STRINGING



PROPERTY OF
L. F. BLANKENSHIP
3024 MEADE ST.
DENVER, COLORADO

AIRLINE
MODEL 35GAA-3969A

AIRLINE
MODEL 35GAA-3969A

TRADE NAME	Airline Model 35GAA-3969A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver with Disc Recorder & Playback Unit.
TUBES (Six)	Types 6BE6 Conv., 6BA6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6AV6 Mic Amp., 6X4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycle RATING .33 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator lug (antenna section) of tuning gang. Low side to chassis.	455KC (400\Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"
4.		"	600KC	Tune to 600KC signal	"		Check tracking. If necessary bend outer rotor plates of antenna section of tuning gang slightly for optimum tracking. Repeat step 3.

Replace chassis in cabinet, turn tuning gang fully closed and set pointer parallel with left hand edge of cabinet at low frequency end of dial.

FOR SERVICE INFORMATION ON RECORDER UNIT PART NO. 2305A - SEE SIMILAR GENERAL INSTRUMENT MODEL R90 - PHOTOFACT SET 35 - FOLDER 28 OR RECORD CHANGER MANUAL CM-1.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

AIRLINE
MODEL 35GAA-3969A

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Converter	6BE6	6BE6	7CH	
V2	IF Amplifier	6BA6	6BA6	7BK	
V3	Det.-AVC-AF Amp	6AV6	6AV6	7BT	
V4	Audio Output	6AQ5	6AQ5	7BZ	
V5	Mic Amplifier	6AV6	6AV6	7BT	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	200	1001	AFH4-45		DO43		FP419.3	TVL-4470	
B	■40	150								
C	▲10	150								
D	20	25								
C2	.1	200	804	PR288-1	DF-104	MP-2P1				
C3A	220		♦		♦PC-151				♦103C5	
B	.01									
C	250									
D										
E	.005									
C4	4700		906	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C5	2000		907	BPD-002	D6-202	TM5D2	801-002	DC-522	5HK-D2	
C6	4700		906	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C7	10000		819-B	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C8	10000		819-B	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	

♦ Items C3A, C3B, C3C, C3D, C3E, R8A, R8B, R8C are combined in one unit.
When replacing separately items C3C and C3D have to total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	401C	Q13-133	AG-60-Z	BSK-60-S	U-48	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	500KΩ	½	408A	Q13-133	AG-60-Z	BSK-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	NOTES
R3	22KΩ	½	517	BTS-22K	
R4	150Ω	½	505	BTS-150	
R5	2.2Meg	½	615	BTS-2.2Meg	
R6	47KΩ	½	523	BTS-47K	
R7	50Ω	½	520		
R8A	5 Meg	½	♦		
B	250KΩ	½			
C	500KΩ	½			
R9	2.2Meg	½	615	BTS-2.2Meg	
R10	330Ω	1	609	BTA-330	
R11	1 Meg	½	516	BTS-1Meg	

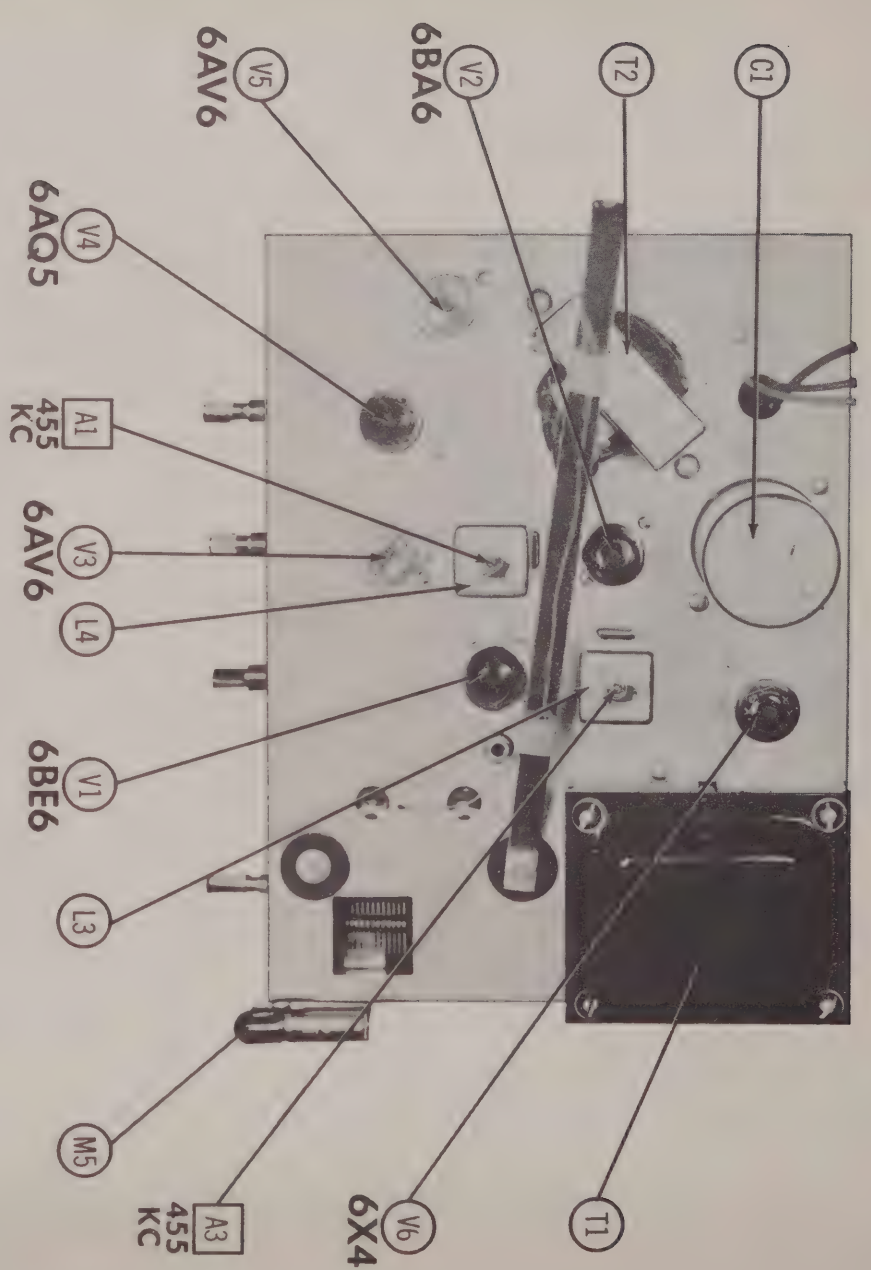
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	NOTES
R12	10KΩ	½	522	BTS-10K	
R13	510KΩ	½	502		
R14	10Ω	½	527		
R15	4.5Ω	½	526		
R16	5 Meg	½	525		
R17	100KΩ	½	507	BTS-100K	
R18	1000Ω	1	607	BTA-1000	
R19	2200Ω	1	616	BTA-2200	
R20	4.5Ω	½	526		Note
R21	10Ω	½	527		Note

Note: Not used in all models.
♦ Items R8A, R8B, R8C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117V @ .33A	340VCT .045A	6.3VAC @ 2.34A		1103				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		AIR LINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	4.6KΩ	3.5Ω	416Ω	15Ω SEC. 2 1.9KΩ	1202					

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIR LINE PART No.	VIKING PART No.	QUAM PART No.	
SP1	4 x 6"	PM	3.5Ω	2610B	46J6	46A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AIR LINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.6Ω		1512-D			69-Osc.	Tapped @ .7Ω
L2	Osc. Coil	5.5Ω		1401			12-C1	
L3	Input IF	13Ω	14Ω	1405	16-6758	BC-352	12-C2	
L4	Output IF	13Ω	14Ω	1406-A	16-6758	BC-353		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	AIR LINE PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	2534	AC-AG-J	A-AG	W26B	A66U	33	0-2 or S-2	* Crystal cutter
M2	12126	*X-26						

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

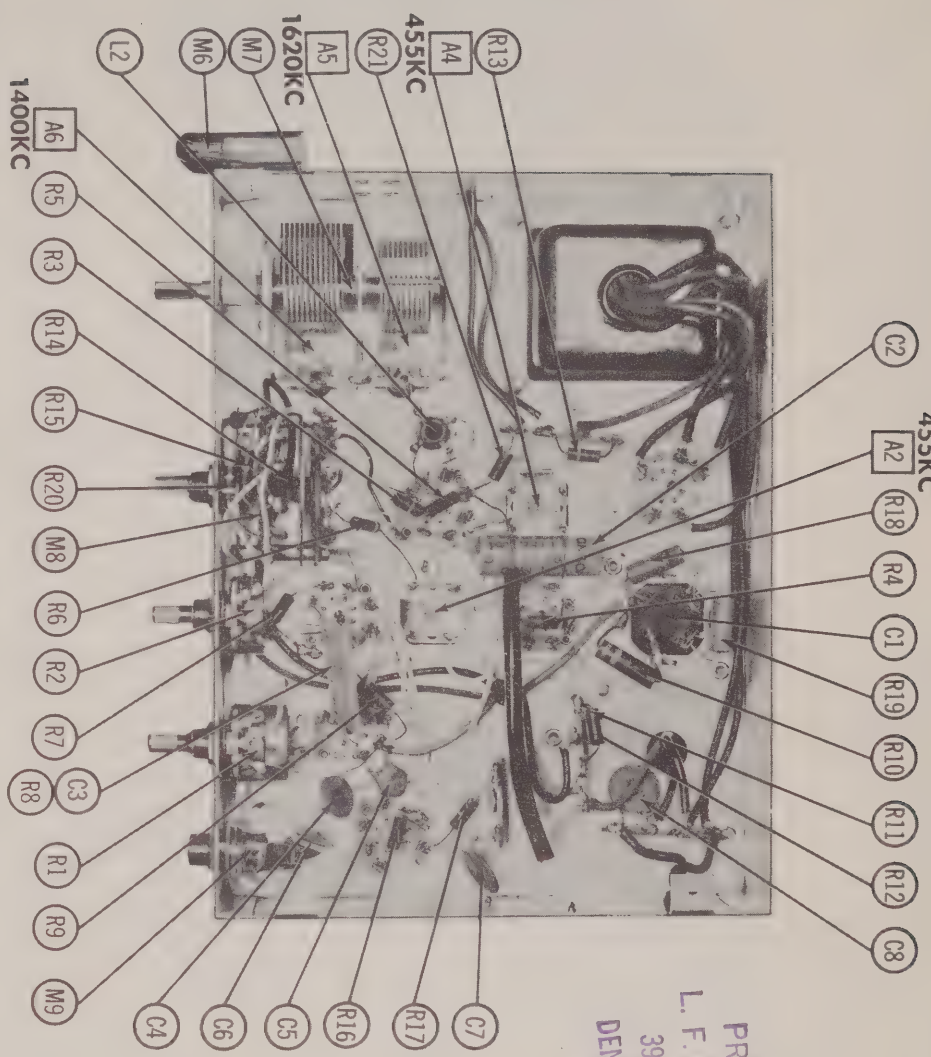
ITEM No.	REPLACEMENT DATA			REMARKS
	AIR LINE PART No.	WALCO PART No.	JENSEN PART No.	
M3	2541	W-20AGA or W-21AGS	E902 or E962	* Cutting needle
M4	*2514A	WC-25		

MISCELLANEOUS

ITEM No.	PART NAME	AIR LINE PART No.	NOTES
M5	Level Indicator	2202-A	Type NE51
M6	Dial Light		Type #47
M7	Tuning Cap.	1011	28-410MMF, 23-200MMF
M8	Switch	2204	Function Selector
M9	Shorting Type Jack	1875	2 Used (Mic & Ext. Spkr.)
	Case	2107-A	
	Dial Plate	2801	
	Pointer	1736-B	
	Knob	2401-A	Tuning, Volume, Off/On/Tone (3 used)
	Knob	2401	Function Selector

SET 227 FOLDER 1

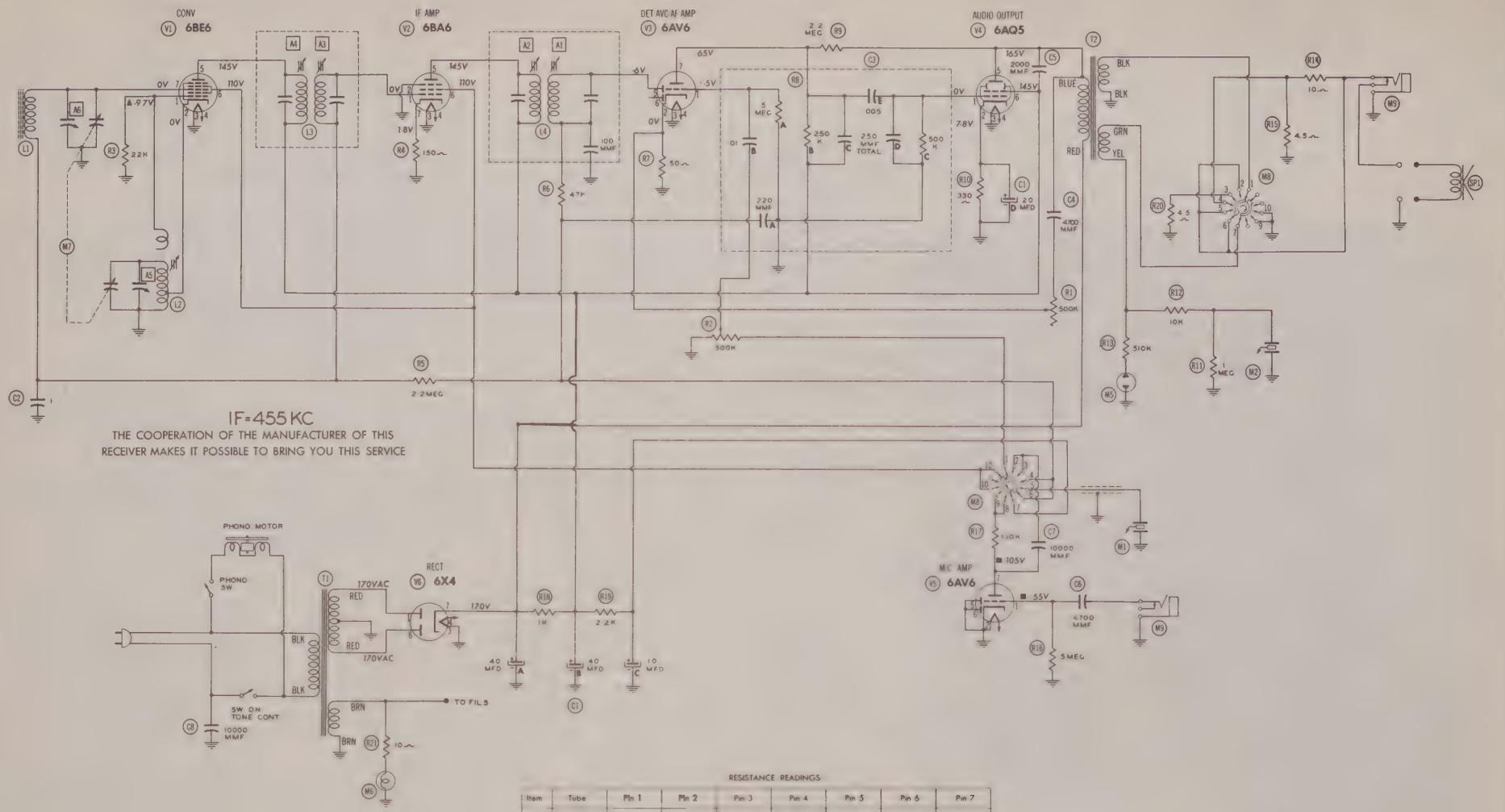
CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3924 MILADE ST.
DENVER, COLORADO

AIR LINE MODEL 35GAA-3969A

AIR LINE MODEL 35GAA-3969A



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BE6	33KΩ	.7Ω	0Ω	.1Ω	†1KΩ	†3.2KΩ	2.7Meg
V 2	6BA6	2.7Meg	0Ω	0Ω	.1Ω	†1KΩ	†3.2KΩ	150Ω
V 3	6AV6	5Meg	50Ω	0Ω	.1Ω	550KΩ	INF	†220KΩ
V 4	6AQ5	500KΩ	330Ω	0Ω	.1Ω	†416Ω	†1KΩ	500KΩ
V 5	6AV6	5Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	■†100KΩ
V 6	6X4	115Ω	INF	0Ω	.1Ω	INF	115Ω	900KΩ

ALL MEASUREMENTS TAKEN IN "RECORD RADIO" POSITION UNLESS OTHERWISE SPECIFIED
■ MEASURED IN "RECORD MIKE" POSITION
▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V6

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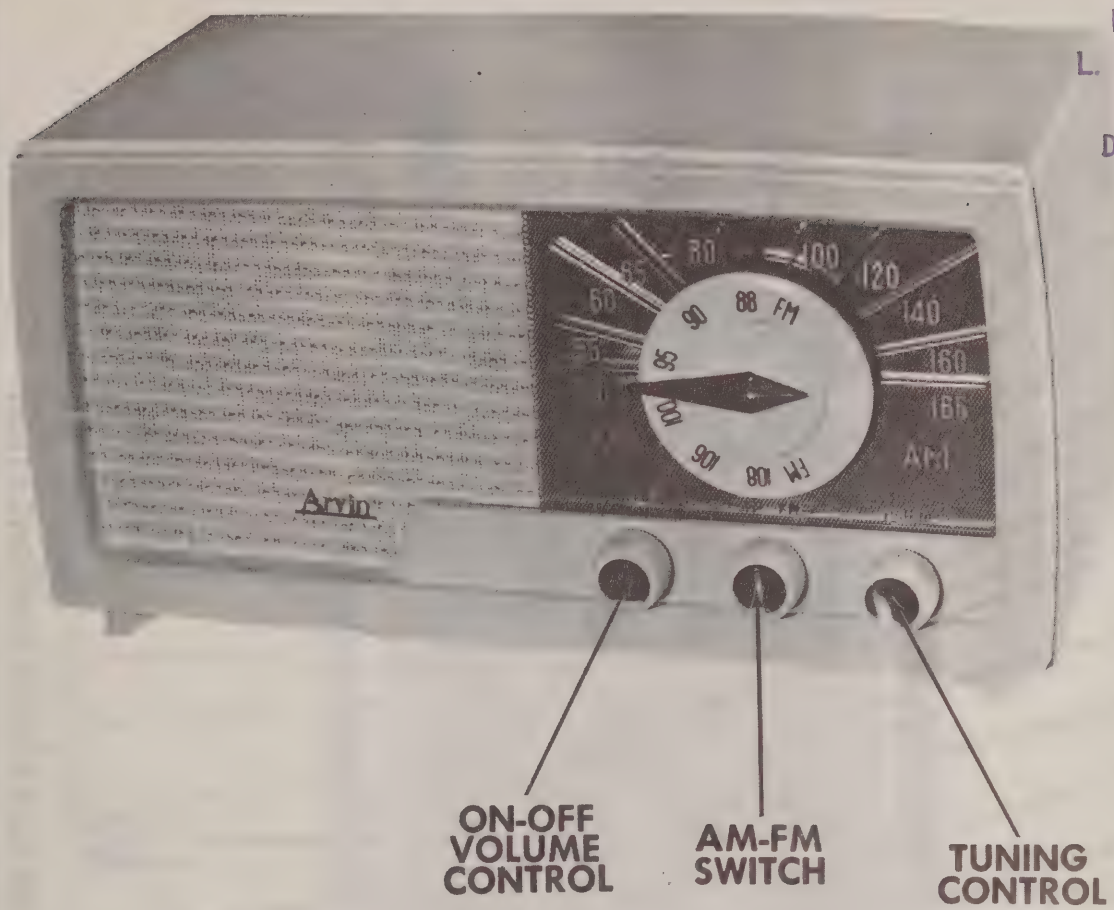
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ARVIN
MODELS 581TFM, 780TFM (Ch. RE333)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ARVIN
MODELS 581TFM, 780TFM (Ch. RE333)



ARVIN
MODELS 581TFM, 780TFM (Ch. RE333)

TRADE NAME	Arvin Models 581TFM, 780TFM (Ch. RE333)	
MANUFACTURER	Arvin Industries, Inc., Columbus, Ind.	
TYPE SET	AC Operated AM-FM Superheterodyne Receiver	
TUBES (Eight)	Types 6CB6 FM RF Amp., 12AT7 FM Conv., 6BE6 Conv., (2) 6BA6 IF Amp., 6T8 Ratio Det.-AM Det.-AVC-AF Amp., 6V6GT Audio Output, 6X4 Rectifier	
POWER SUPPLY	105-120 Volts AC-60 Cycles	RATING .37 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	540KC -1600KC	FREQ. MOD. 88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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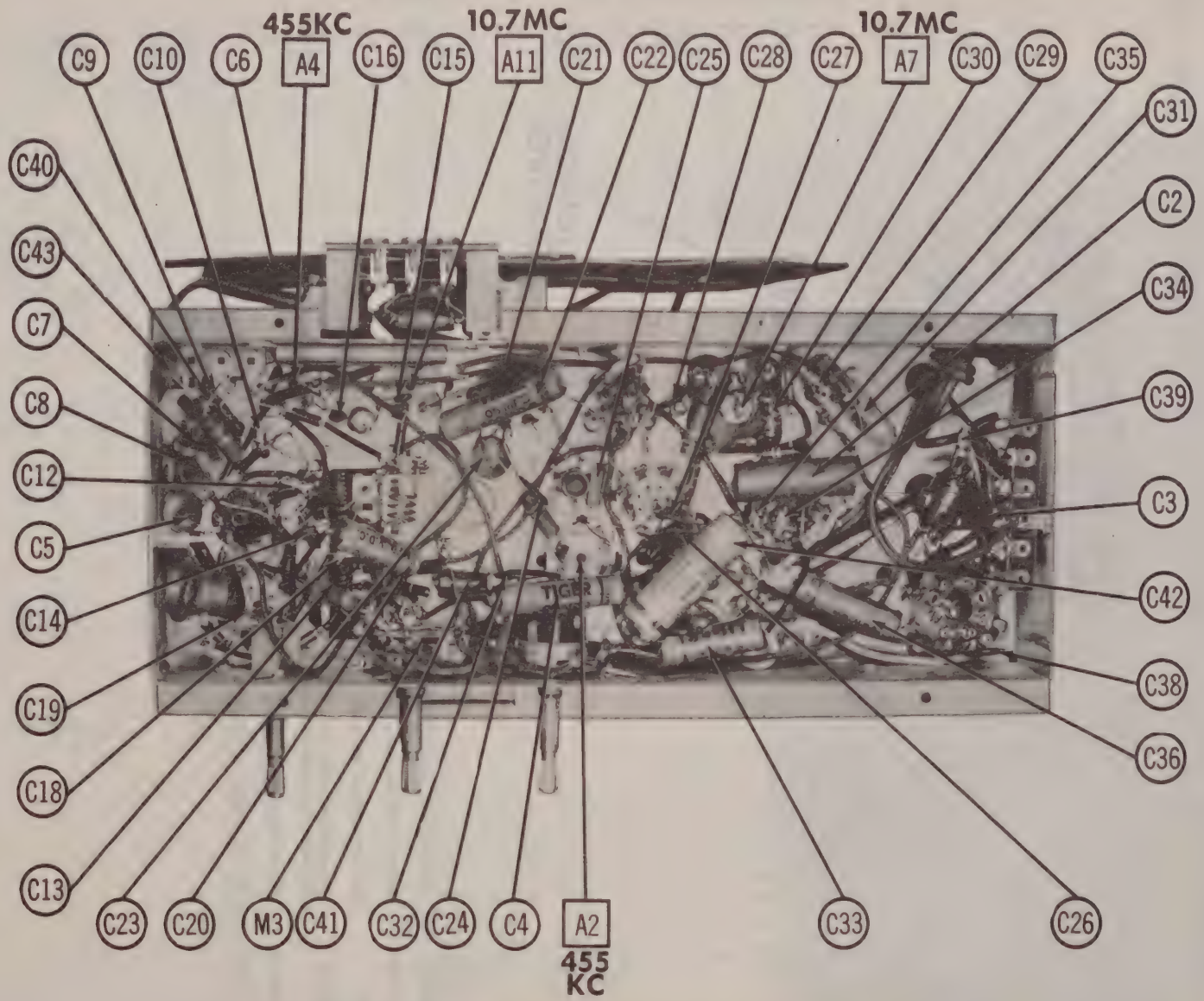
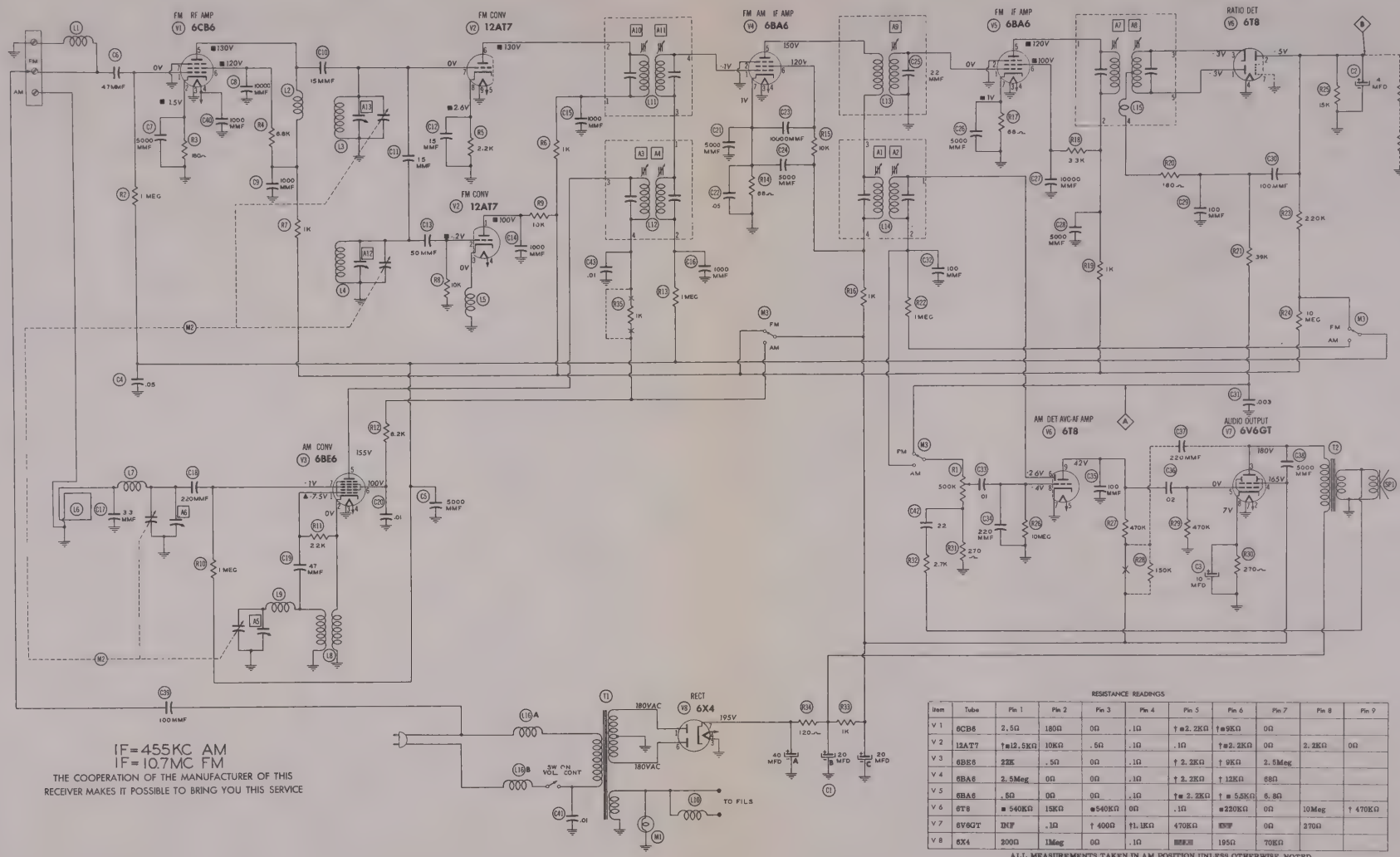


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



IF=455KC AM
IF=10.7MC FM

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	2.5Ω	180Ω	0Ω	.1Ω	†■2.2KΩ	†■9KΩ	0Ω		
V 2	12AT7	†■12.5KΩ	10KΩ	.5Ω	.1Ω	.1Ω	†■2.2KΩ	0Ω	2.2KΩ	0Ω
V 3	6BE6	22K	.5Ω	0Ω	.1Ω	† 2.2KΩ	† 9KΩ	2.5Meg		
V 4	6BA6	2.5Meg	0Ω	0Ω	.1Ω	† 2.2KΩ	† 12KΩ	68Ω		
V 5	6BA6	.5Ω	0Ω	0Ω	.1Ω	†■ 2.2KΩ	† ■ 5.5KΩ	6.8Ω		
V 6	6T8	■ 540KΩ	15KΩ	■540KΩ	0Ω	.1Ω	■220KΩ	0Ω	10Meg	† 470KΩ
V 7	6V6GT	INF	.1Ω	† 400Ω	†1.1KΩ	470KΩ	INF	0Ω	270Ω	
V 8	6X4	200Ω	1Meg	0Ω	.1Ω	[illegible]	195Ω	70KΩ		

ALL MEASUREMENTS TAKEN IN AM POSITION UNLESS OTHERWISE NOTED
■ TAKEN IN FM POSITION.
† MEASURED FROM PIN 7 OF V8.

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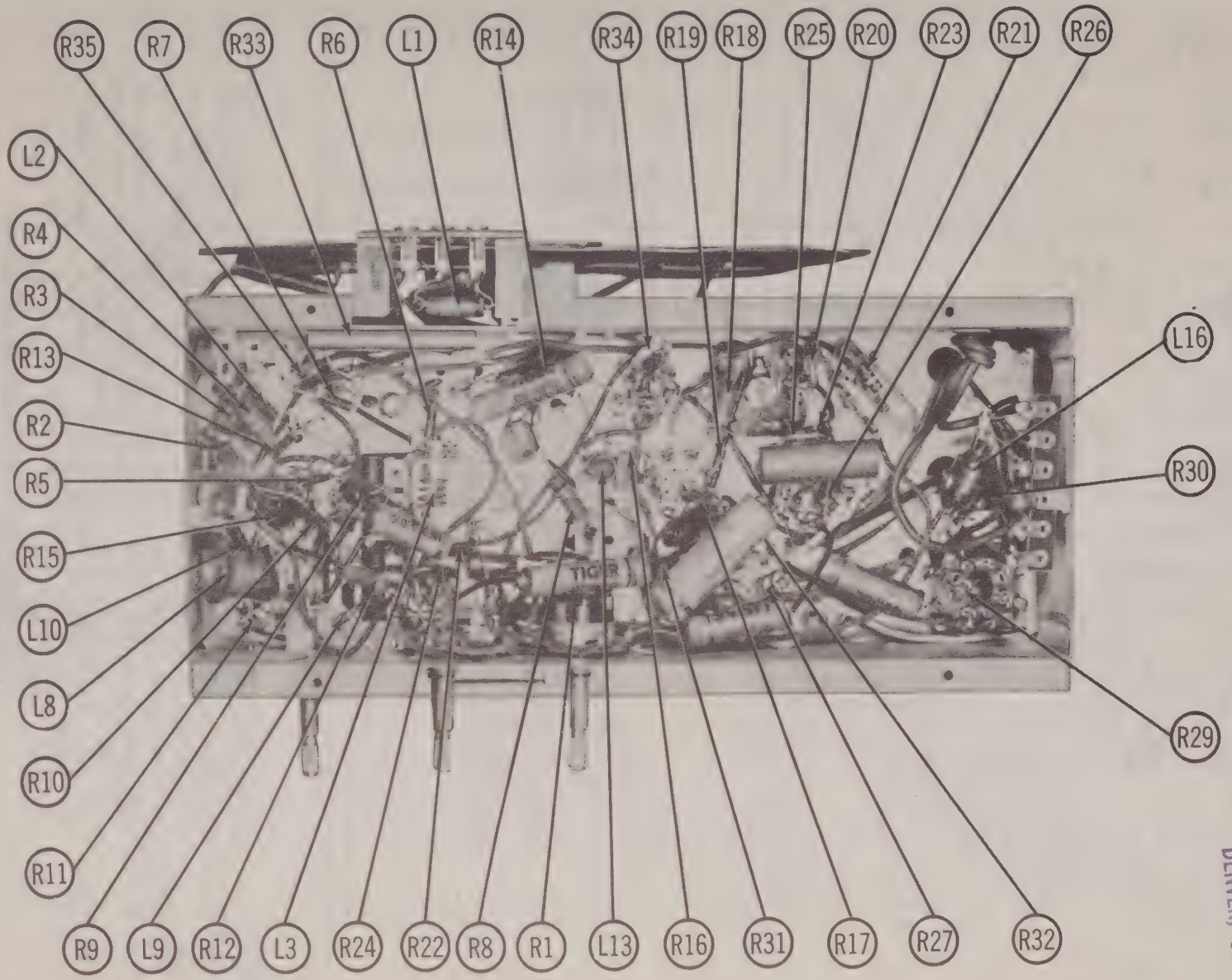


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
With tuning gang fully closed set dial pointer parallel with base of chassis.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400~Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection. Attenuate generator to maintain 1 volt at VTVM.
2.		Loop	1650KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	"	Tune to 1400KC signal	"	A6	"
4.		"	600KC	"	Tune to 600KC signal	"		Rock antenna section of tuning gang for maximum deflection. Repeat steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓑ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.005MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (Unmod)	FM	Tuning gang fully open	DC probe to point Ⓑ. Common to chassis.	A7, A9 A10, A11	Adjust for maximum deflection. Attenuate signal generator to maintain 1 Volt at VTVM.
6.	"	"	10.7MC	"	"	DC probe to point Ⓐ. Common to point Ⓒ.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.005MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. Amp. thru 10KΩ to point Ⓑ. Low side to chassis.	A7, A9 A10, A11	Adjust for maximum amplitude and symmetry as in Fig. 1.
6.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A8	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and symmetry of crossover lines.

FM RF ALIGNMENT

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
7.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	108.5MC (400~Mod 45KC Swp)	FM	Tuning gang fully open	Across voice coil	A12	Adjust for maximum deflection. Attenuate signal generator to maintain 1 volt at VTVM.
8.	"	"	87.5MC	"	Tuning gang fully closed	"		Compress or expand L4 for maximum deflection. Repeat step 7.
9.	"	"	105MC	"	105MC	"	A13	Adjust for maximum deflection while rocking gang thru 105MC.
10.	"	"	90MC	"	90MC	"		Compress or expand L3 for maximum deflection. Repeat step 9.
11.	Check calibration and band coverage (87.5MC to 108.5MC). If necessary repeat steps 9 and 10.							

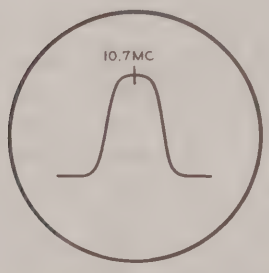


FIG. 1

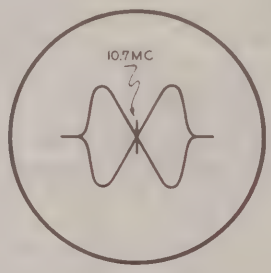


FIG. 2

PARTS LIST AND DESCRIPTIONS

ARVIN
MODEL 581TFM (Ch. RE333)

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		ARVIN PART No.	STANDARD REPLACEMENT		
V1	FM RF Amplifier	6CB6	6CB6	7CM	
V2	FM Converter	12AT7	12AT7	9A	
V3	AM converter	6BE6	6BE6	7CH	
V4	FM AM IF Amp.	6BA6	6BA6	7BK	
V5	FM IF Amp.	6BA6	6BA6	7BK	
V6	Ratio Detector-AM Detector-AVC AF Amplifier	6T8	6T8	9E	
V7	Audio Output	6V6GT	6V6GT	7S	
V8	Rectifier	6X4	6X4	5BS	

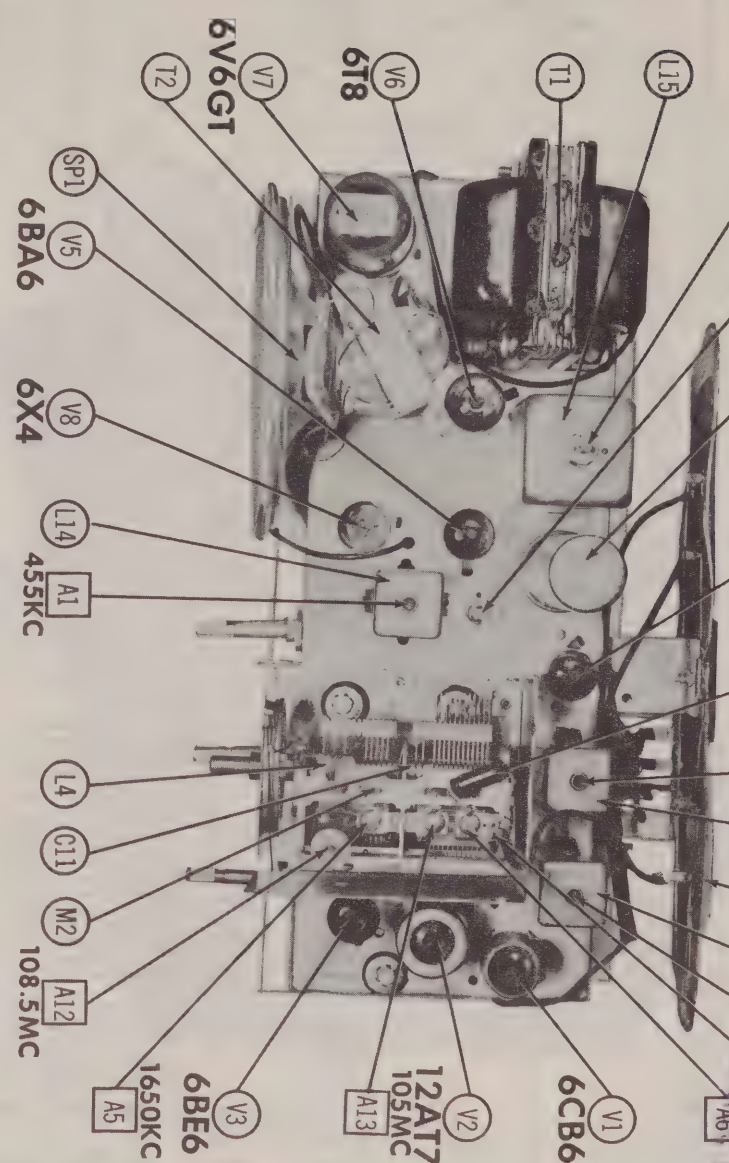
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■40	250	A228-06	AFH3-20		CO16			TVL-2540	
B	▲20	250								
C	20	250								
C2	4	25	A22659	PRS25/4		BBR4-50T		TC30	TVA-1203	
C3	10	25	A22602	PRS25/10		BR102A		TC22	TVA-1204	
C4	.05	200	C20067-503	P288-05	DF-503	PTE4S5		PT415	2TM-S5	
C5	5000		A21674	BPD-005	D6-502	TM5D5	GP2-333-502	DC-525	5HK-D5	
C6	47		C20203-470	SI47	D6-470			UC-5447	5GA-Q47	
C7	5000		A21674	BPD-005	D6-502	TM5D5	GP2-333-502	DC-525	5HK-D5	
C8	10000		A22295	BPD-01	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C9	1000		A23078	BPD-001	D6-102	TM5D1	GP2L-102	DC-521	5HK-D1	
C10	15		C20203-150	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C11	1.5		A20238-3	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515		
C12	15		C20203-150	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C13	50		C20205-5		TCN-50					
C14	1000		A23078	BPD-001	D6-102	TM5D1	GP2L-102	DC-521	5HK-D1	
C15	1000		A23078	BPD-001	D6-102	TM5D1	GP2L-102	DC-521	5HK-D1	
C16	1000		A23078	BPD-001	D6-102	TM5D1	GP2L-102	DC-521	5HK-D1	
C17	3.3		C20205-20	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533		
C18	220		C20203-221	SI220	D6-221		GP1K-220	UC-5322	5GA-T22	
C19	47		C20203-470	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C20	.01	400	C20068-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C21	5000-		A21674	BPD-005	D6-502	TM5D5	GP2-333-502	DC-525	5HK-D5	
C22	.05	200	C20067-503	P288-05	DF-503	PTE4S5		PT415	2TM-S5	
C23	10000		A22295	BPD-01	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C24	5000		A21674	BPD-005	D6-502	TM5D5	GP2-333-502	DC-525	5HK-D5	
C25	22	500		SI22	D6-220		GP1K-220	UC-5422	5GA-Q22	
C26	5000		A21674	BPD-005	D6-502	TM5D5	GP2-333-502	DC-525	5HK-D5	
C27	10000		A22295	BPD-01	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C28	5000		A21674	BPD-005	D6-502	TM5D5	GP2-333-502	DC-525	5HK-D5	
C29	100		C20203-101	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C30	100		C20203-101	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C31	.003	600	C20067-302	P688-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	
C32	100		C20203-101	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C33	.01	400	C20068-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C34	220		C20203-221	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C35	100		C20203-101	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C36	.02	400	C20068-203	P488-02	DD-203	PTE4S2		PT412	4TM-S2	
C37	220		C20065-221	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	Note 1
C38	5000		A203078	BPD-005	D6-502	TM5D5	GP2-333-502	DC-525	5HK-D5	Note 2
C39	100		C20203-101	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C40	1000		A23078	BPD-001	D6-102	TM5D1	GP2L-102	DC-521	5HK-D1	
C41	.01	400	C20249-103	P488-01		PTE4S1		PT411	4TM-S1	
C42	.22	200		P288-22		PTE4S22		PT422	4TM-S22	Note 1.
C43	.01	400	C20249-103	P488-01		PTE4S1		PT411	4TM-S1	Note 1

Note 1. Not used in all Models.
Note 2. Some Models use a 1000MMF in this application.

CHASSIS—TOP VIEW



PROPERTY OF
U. OF COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	C40586	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R2	1Meg	½	C20061-105	BTS-1Meg	
R3	180Ω	½	C20061-181	BTS-180	
R4	6800Ω	1	C20070-682	BTA-6800	
R5	2200Ω	½	C20061-222	BTS-2200	
R6	1000Ω	½	C20061-102	BTS-1000	
R7	1000Ω	½	C20061-102	BTS-1000	
R8	10KΩ	½	C20061-103	BTS-10K	
R9	10KΩ	½	C20061-103	BTS-10K	
R10	1Meg	½	C20061-105	BTS-1Meg	
R11	22KΩ	½	C22061-223	BTS-22K	
R12	8200Ω	1	C22070-822	BTA-8200	
R13	1Meg	½	C200 61-105	BTS-1Meg	
R14	68Ω	½	C20061-680	BTS-68	
R15	10KΩ	1	C2270-103	BTA-10K	
R16	1000Ω	½	C20061-102	BTS-1000	
R17	68Ω	½	C20061-680	BTS-68	
R18	3300Ω	1	C20070-332	BTA-3300	
R19	1000Ω	½	C20061-102	BTS-1000	
R20	180Ω	½	C20061-181	BTS-180	
R21	39KΩ	½	C20061-393	BTS-39K	
R22	1Meg	½	C20061-105	BTS-1Meg	
R23	220KΩ	½	C20061-224	BTS-220K	
R24	10Meg	½	C20061-106	BTS-10Meg	
R25	15KΩ	½	C22381-153	BTS-15K	
R26	10Meg	½	C20061-106	BTS-10Meg	
R27	470KΩ	½	C20061-474	BTS-470K	Note 1.
R28	150KΩ	½	C20061-154	BTS-150K	Note 1.
R29	470KΩ	½	C20061-474	BTS-470K	
R30	270Ω	1	C20070-271	BTA-270	Note 2.
R31	270Ω	1	C20070-271	BTA-270	Note 2.
R32	2700Ω	½	C20061-272	BTS-2700	
R33	1000Ω	10	A24774	1 3/4A-1000	
R34	120Ω	1	A23933		
R35	1000Ω	½	C20061-102	BTS-1000	

Note 1. Some models may use a 330KΩ and 150KΩ in series in this application.
Note 2. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @.37A	385VCT .050ADC	6.3VAC @3A		D22959				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	6.4KΩ	3.5Ω	280Ω	.3Ω	AC22995-1	A-3877 ①	A-3026	RO-9 ①	S-3X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.5Ω	N22760	ST-105 ① Mod. P5-X	5A1 ①	① Drill mounting holes in Mag. frame

PARTS LIST AND DESCRIPTIONS (Continued)

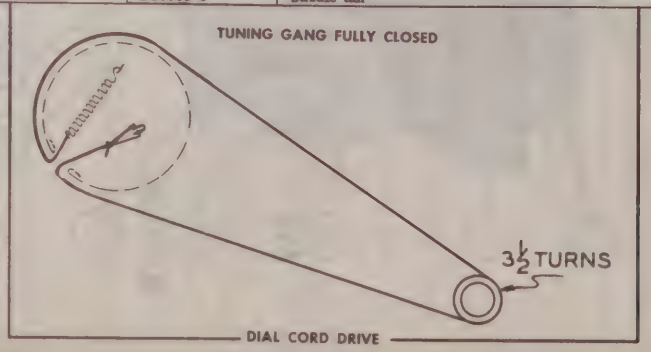
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	.1Ω		AA22648-1			4604	1. 5Microhenries
L2	RF Choke	.6Ω		AA21445-1			4610	7. 5Microhenries
L3	FM RF Coil	0Ω		A22593				
L4	FM Osc. Coil	0Ω		AA22594-1				
L5	Cathode choke	.4Ω		AA2597-1			4606	3Microhenries
L6	AM Loop Ant.	.3Ω	2. 7Ω	D24770				
L7	Ant. Loading Coil	.7Ω		AC24308-1			4612	10Microhenries
L8	AM Osc. Coil	.6Ω	7. 5Ω	AC22587-1			70-Osc. *	
L9	Parasitic Suppresson	0Ω		AA22334-1				
L10	Fil. Choke	.9Ω		A21673			4624	14Microhenries
L11	1st FM IF	1.1Ω	1.1Ω	C40690	16-3471	FM-251	1451	
L12	1st AM IF	10Ω	10Ω	C24771	16-6666 †	BC-368 †	1312-C1 †	
L13	2nd FM IF	.3Ω	.6Ω	AC40614-1				
L14	2nd AM IF	10Ω	10Ω	C24771	16-6667 †	BC-371 †	1312-C4†	
L15	Ratio Det.	.9Ω	.1ΩCT	AD22592-1	17-3487	FM-255 ▲	1465 ▲	Tertiary winding=. 25Ω
L16A	Line RF Filter Choke	.1Ω		AA22334-1			4608	4Microhenries
B	Line RF Filter Choke	.1Ω					4608	4Microhenries

* Disregard tap on secondary winding.
† Drill one new mounting hole.
▲ Use adaptor plate.

MISCELLANEOUS

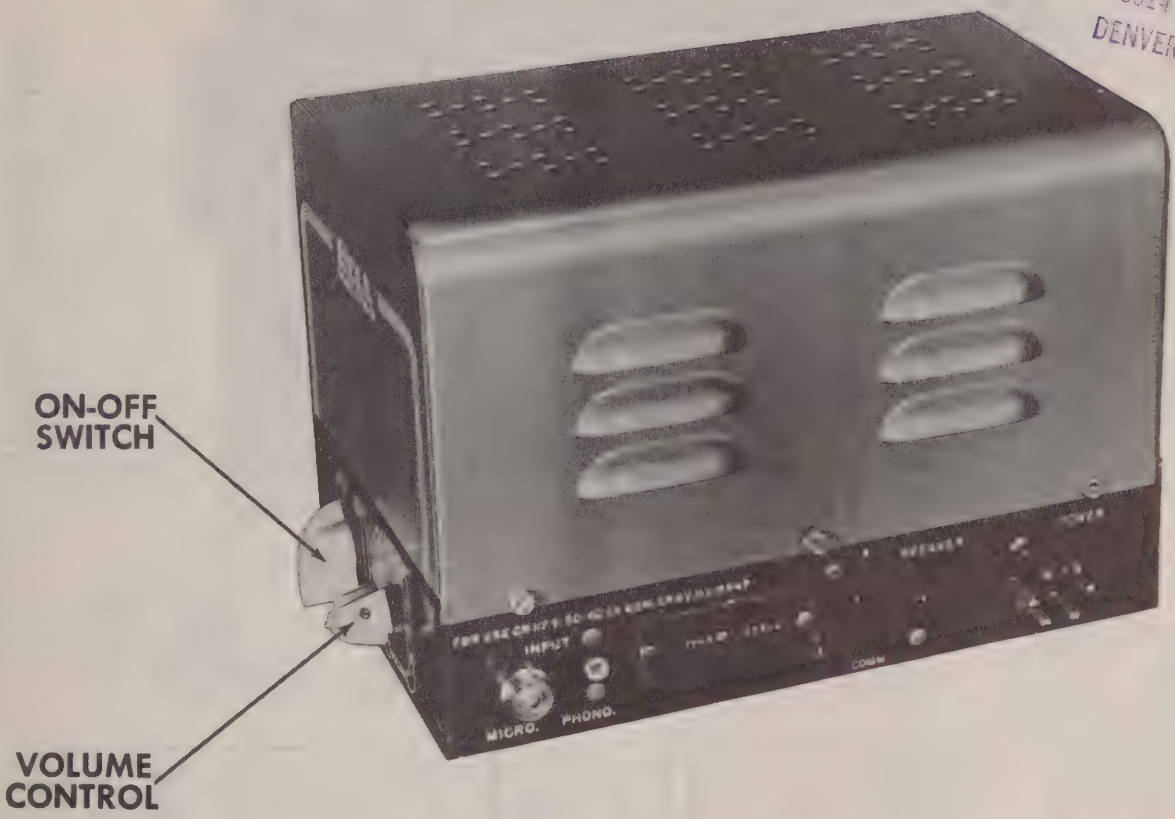
ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Dial Light		Type #47
M2	Tuning Cap.	24773	4 gang - AM (38-517MMF, 17-130MMF)
M3	Switch	C22961-1	AM-FM Selector
A12	Trimmer Cap.	A22724	Osc. trimmer (5-25MMF)
	Cabinet	R25763-1	G.P. brown
	Cabinet	R25763-3	Rosewood
	Cabinet	R25763-4	Ebony
	Back Cover	C40605-1	
	Dial Crystal	E25762	
	Knob	A40549-1	Ivory (3 required)
	Knob	A40549-2	Willow green (3 required)
	Knob	A40549-3	Brown (3 required)
	Knob	A40549-4	Black (3 required)
	Knob	A40549-5	Saddle tan (3 required)
	Dial Pointer	D25765-1	Ivory
	Dial Pointer	D25765-2	Willowgreen
	Dial Pointer	D25765-3	Brown
	Dial Pointer	D25765-4	Black
	Dial Pointer	D25765-5	Saddle tan



BELL SOUND
MODEL 3706-M

PROPERTY OF
L. F. BLANKENSHIP
3324 MEADE ST.
DENVER, COLORADO

BELL SOUND
MODEL 3706-M



BELL SOUND
MODEL 3706-M

TRADE NAME	Bell Sound Model 3706-M
MANUFACTURER	Bell Sound Systems Inc., 555 Marion Rd., Columbus, Ohio
TYPE SET	AC-Battery Operated Two Channel 6 Watt Audio Amplifier
TUBES (Four)	Types 6SJ7 Pre-Amp., 6SN7GT AF Amp., 6L6G Audio Output, 6X5GT Rectifier
POWER SUPPLY RATINGS	110-120 Volts AC (or) 6 Volt Storage Battery .55 Amp. @ 117 Volts AC (or) 9 Amp. @ 6.3 Volts DC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

BELL SOUND MODEL 3706-M

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		Bell Sound PART No.	STANDARD REPLACEMENT		
V1	Pre. Amplifier	6SJ7	6SJ7	8N	
V2	AF Amplifier	6SN7GT	6SN7GT	8BD	
V3A	Audio Output	6L6Q	6L6Q	7S	
B	Audio Output	6L6GA	6L6GA	7S	
V4	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Bell Sound PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	450		AFH3-138		CO97		FP366	TVL-3751	
B	▲10	450								
C	50	25								
C2A	■20	450								
B	▲20	450		AFH3-138		CO97		FP366	TVL-3751	Note 1
C	50	25								
C3	.02	600		P688-02		PTE6S2		PT612	6TM-S2	
C4	.01	400		P488-01	D6-103	PTE4S1		PT411	4TM-S1	
C5	.02	600		P68K-02		PTE6S2		PT612	6TM-S2	
C6	.25	200		P488-25		PJ2P25				
C7	.25	200		P488-25		PJ2P25				
C8	.004	1600		1688-004		PTE16D4		PT1624	MB-D4	Note 2
C9	.004	1600		1688-004		PTE16D4		PT1624	MB-D4	

Note 1. Some Models use a 20-10-50 @ 450/25 in this application.
Note 2. Some Models use a .002MFD @ 1600 V in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Bell Sound PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	B20066P68	Q13-133	AG-60-Z	B-60-S	U-48	Volume - Note
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

Note: Some models may use alternate control Part No. B20066P64.

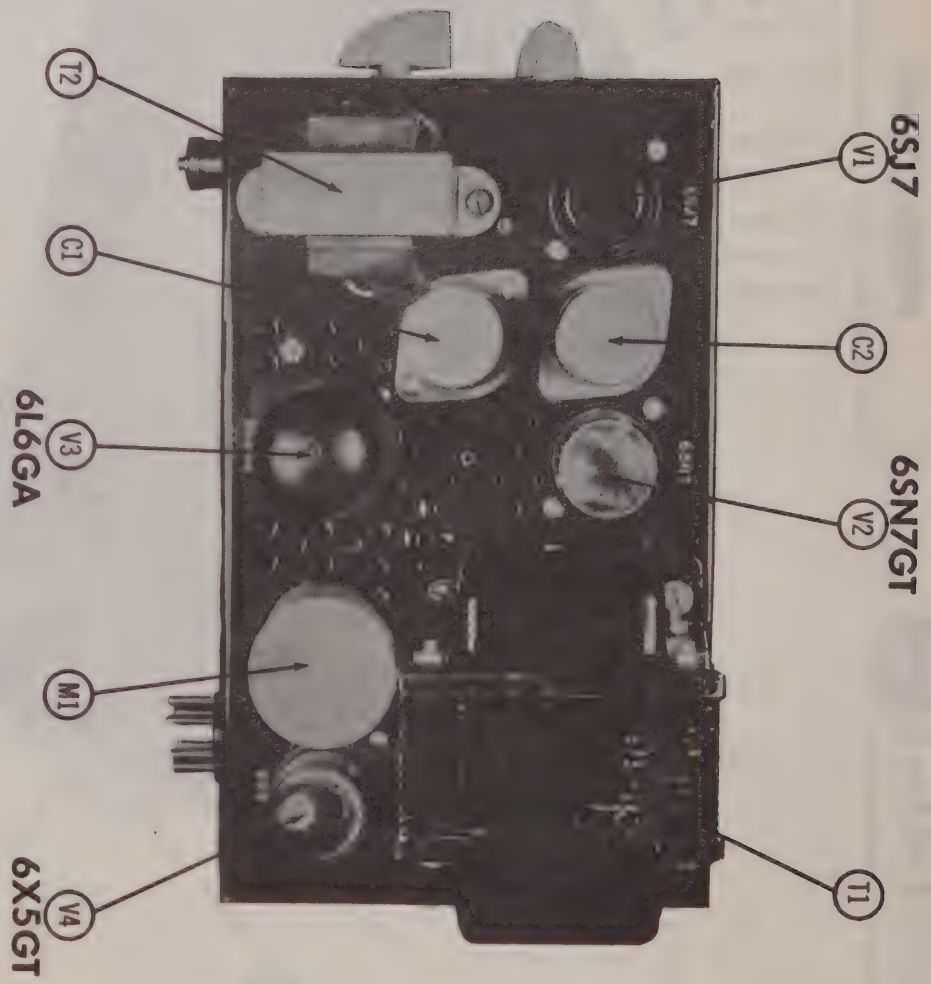
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Bell Sound PART No.	IRC PART No.	
R2	3.3MegΩ	½		BTS-3.3Meg	Note 1
R3	16KΩ	½		BTS-16K	Note 5
R4	100KΩ	½		BTS-100K	
R5	100KΩ	½		BTS-100K	
R6	270KΩ	½		BTS-270K	
R7	270KΩ	½		BTS-270K	
R8	3300Ω	½		BTS-3300	
R9	100KΩ	½		BTS-100K	
R10	2700Ω	½		BTS-2700	
R11	470KΩ	½		BTS-470K	
R12	100KΩ	½		BTS-100K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Bell Sound PART No.	IRC PART No.	
R13	270KΩ	½		BTS-270K	
R14	270Ω	2			Note 2
R15	10KΩ	2		BTB-10K	
R16	27KΩ	½		BTS-27K	
R17	270Ω	½		BTS-270	Note 3
R18	68Ω	1			Note 4
R19	150KΩ	½		BTS-150K	
R20	47KΩ	½		BTS-47K	Note 4
R21	470Ω	½		BTS-470	
R22	47KΩ	½		BTS-47K	

Note 1. Some models may use a 10MegΩ resistor in this application.
Note 2. Some models may use a 250Ω 2 Watt resistor in this application.
Note 3. Some models may use a 680Ω 1 Watt resistor in this application.
Note 4. Not used in all models.
Note 5. Some models may use a 15KΩ resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI. 1	SEC. 1	SEC. 2	SEC. 3	Bell Sound PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ .55A PRI. 2 6.3VCT @ 3.2A	694VCT .077ADC	6.3VAC @ 2.7A		B-20162		P-3075		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		Bell Sound PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	5.2KΩ	15Ω tap @ 8Ω, 4Ω	280Ω	1.3Ω tap @ .9Ω, .72Ω	B-20163					

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				Bell Sound PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	60~		5300	859	5300	

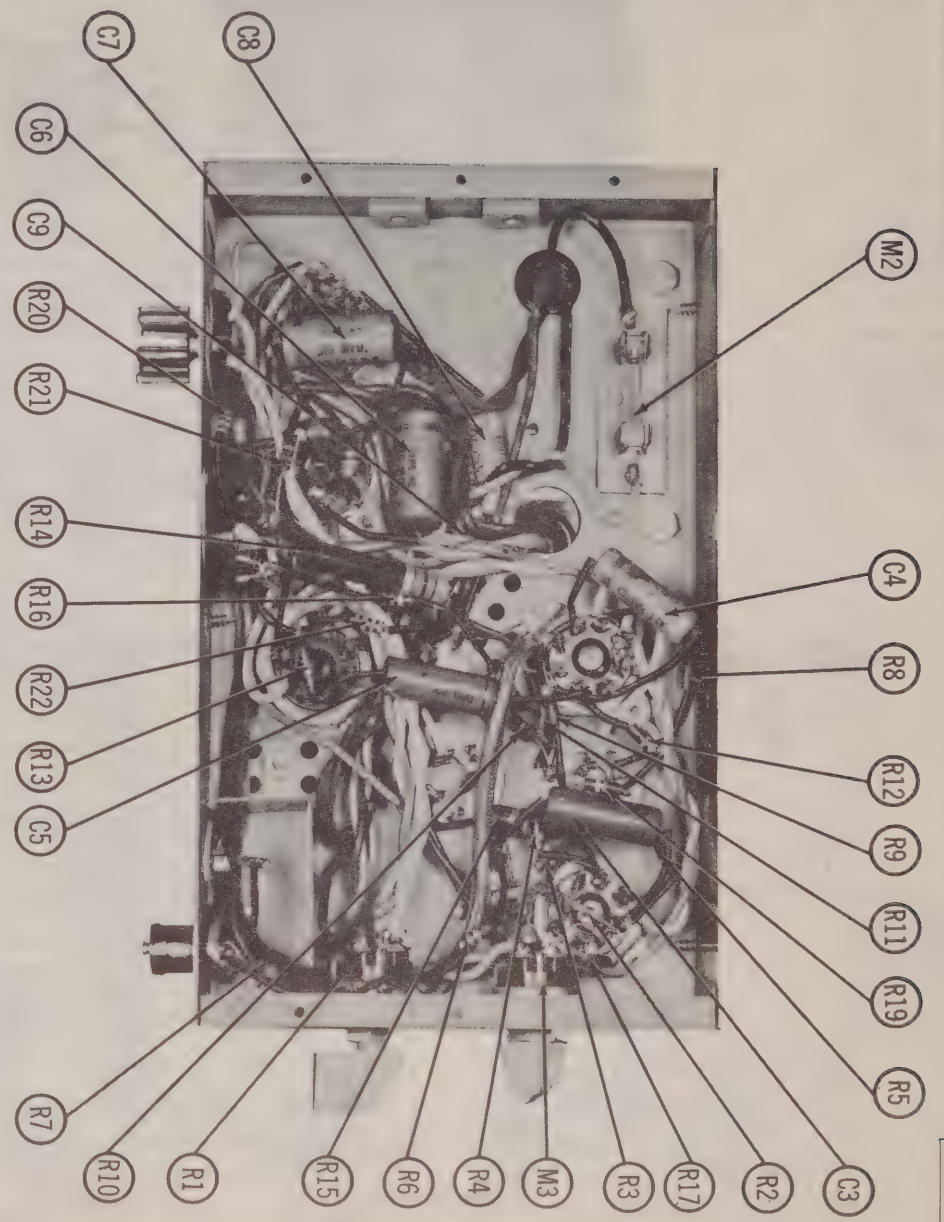
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Bell Sound PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	1A			312001	357001	AGC 1	4405

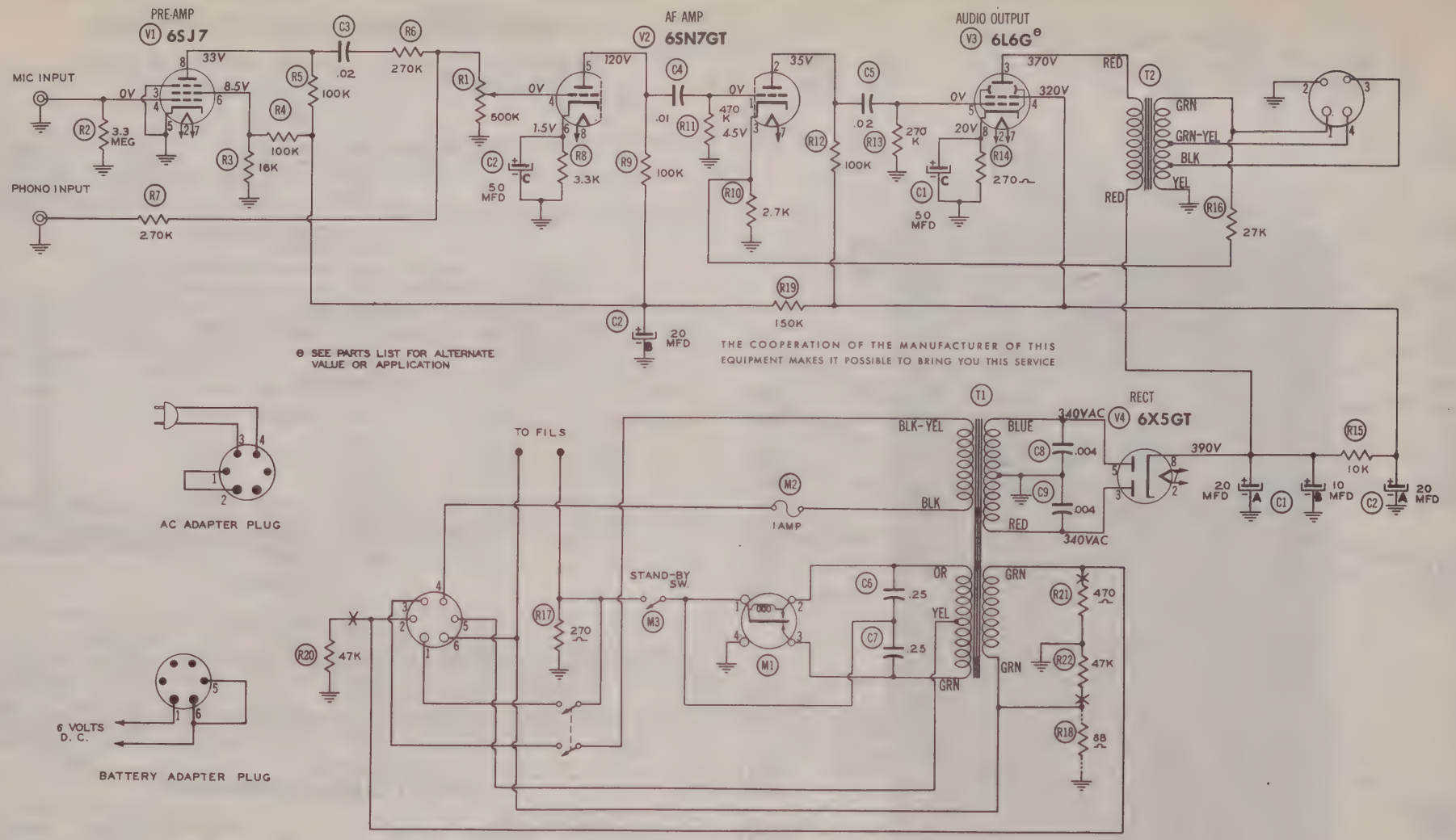
MISCELLANEOUS

ITEM No.	PART NAME	Bell Sound PART No.	NOTES
M3	Switch Knob	B-20048	Battery standby (S. P. S. T. rotary snap) 2 used-plastic pointer type with screw set

CHASSIS—BOTTOM VIEW



DENVER, COLORADO
BELL SOUND
MODEL 3706-M



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SJ7	0Ω	135Ω	0Ω	3.3Meg	0Ω	15KΩ	135Ω	†260KΩ
V 2	6SN7GT	470KΩ	†110KΩ	2.7KΩ	500KΩ	†260KΩ	3.3KΩ	135Ω	135Ω
V 3	6L6G	0Ω	135Ω	†280Ω	†10KΩ	270KΩ	INF	135Ω	270Ω
V 4	6X5GT	INF	135Ω	390Ω	INF	300Ω	INF	135Ω	200KΩ

† MEASURED FROM PIN 8 OF V4

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1 - DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

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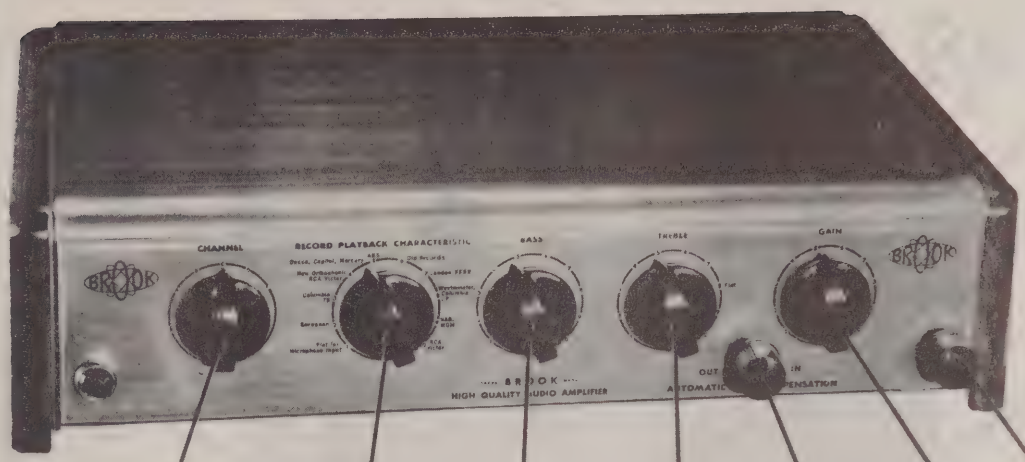
DENVER, COLORADO



INPUT CHANNEL SELECTOR SWITCH

RECORD CHARACTERISTIC SELECTOR

BASS SWITCH

TREBLE SWITCH

COMPENSATION IN-OUT SWITCH

ON-OFF SWITCH

GAIN CONTROL

BROOK MODEL 7

TRADE NAME	Brook Model 7
MANUFACTURER	Brook Electronics, Inc., 34 DeHart Place, Elizabeth 2, N.J.
TYPE SET	AC Operated 5 Channel Audio Pre-Amplifier
TUBES (Five)	Types 6J7 Pre-Amp., 6SJ7 Pre-Amp., 6SJ7 AF Amp., (2) 6C4 AF Amp., 6X4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .21 Amp. @ 117 Volts AC

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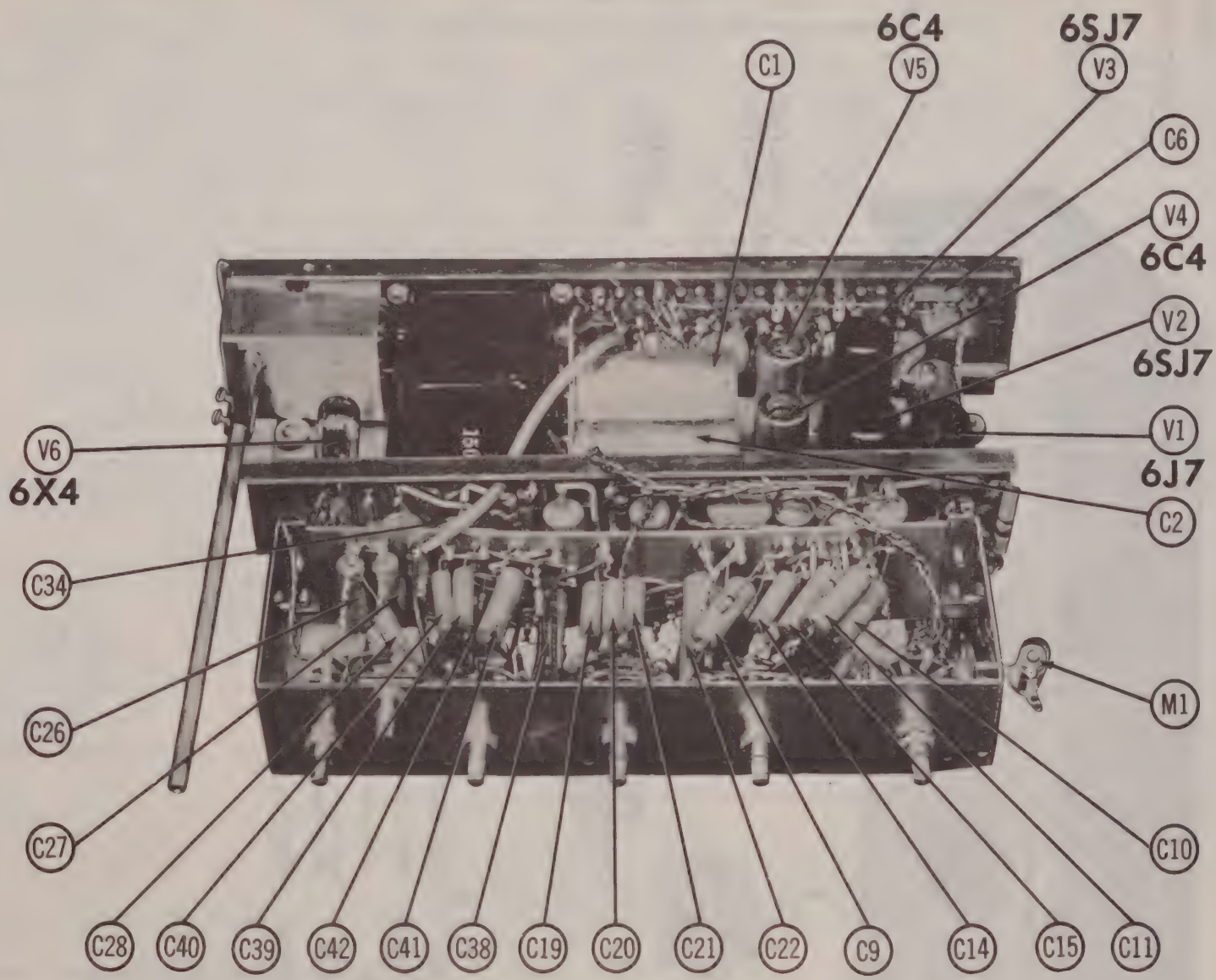
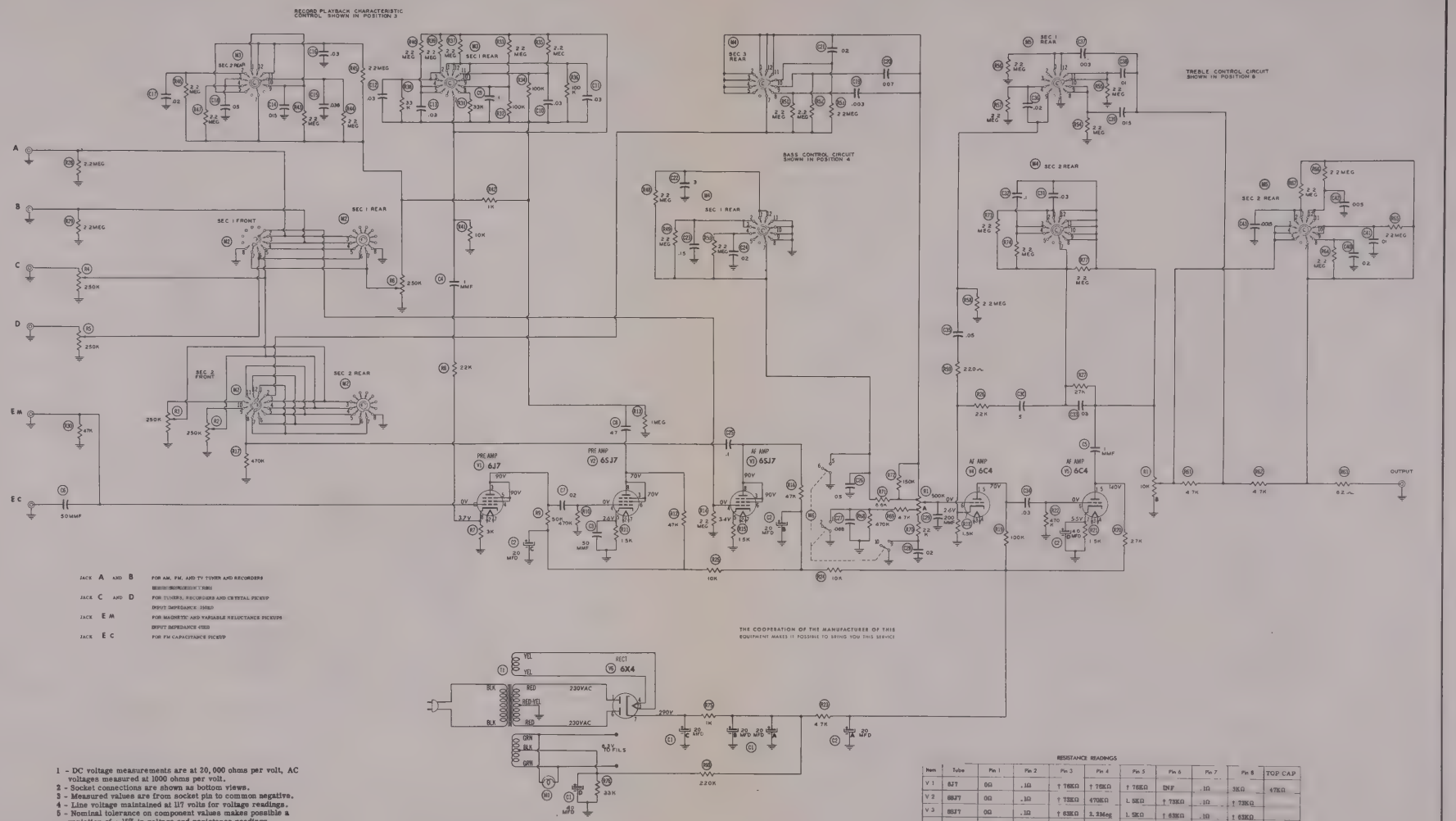


CHASSIS TOP VIEW-CAPACITOR IDENTIFICATION



JACK A AND B — FOR AM, FM, AND TV TUNER AND RECORDER

JACK C AND D — FOR TUNERS, RECORDERS AND CRYSTAL PICKUP
INPUT IMPEDANCE 350Ω

JACK Em — FOR MAGNETIC AND VARIABLE RELUCTANCE PICKUPS
INPUT IMPEDANCE 47KΩ

JACK Ec — FOR FM CAPACITANCE PICKUP

1 - DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	TOP CAP
V 1	6J7	0Ω	.1Ω	† 78KΩ	† 78KΩ	† 78KΩ	INF	.1Ω	3KΩ	47KΩ
V 2	6SJ7	0Ω	.1Ω	† 73KΩ	470KΩ	1.5KΩ	† 73KΩ	.1Ω	† 73KΩ	
V 3	6SJ7	0Ω	.1Ω	† 63KΩ	3.2Meg	1.5KΩ	† 63KΩ	.1Ω	† 63KΩ	
V 4	6C4	† 105KΩ	INF	.1Ω	.1Ω	† 105KΩ	300KΩ	1.5KΩ		
V 5	6C4	† 32KΩ	INF	.1Ω	.1Ω	† 32KΩ	470KΩ	1.5KΩ		
V 6	6X4	450Ω	INF	INF	INF	INF		100KΩ		

† MEASURED FROM PIN 7 OF V6.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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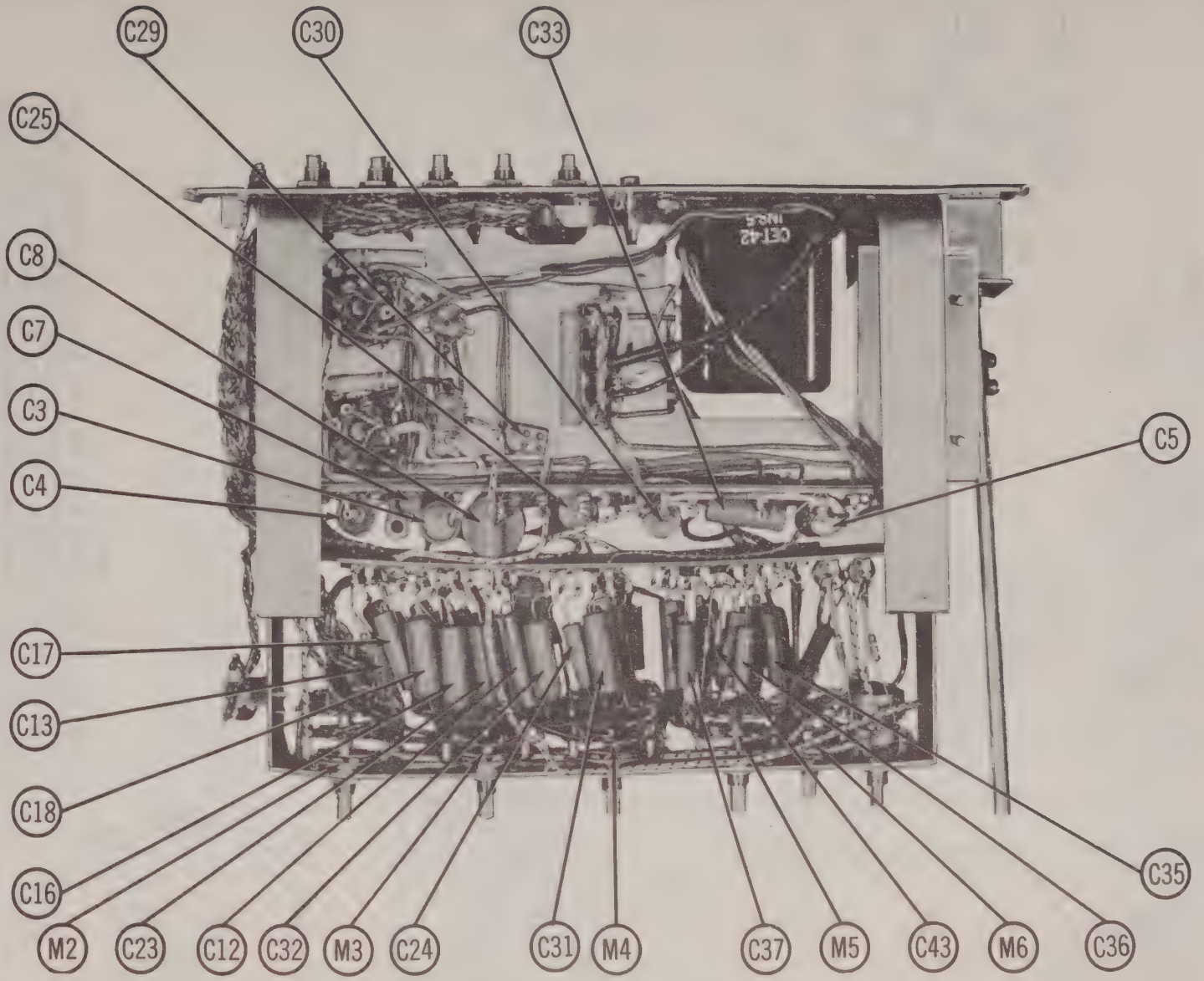

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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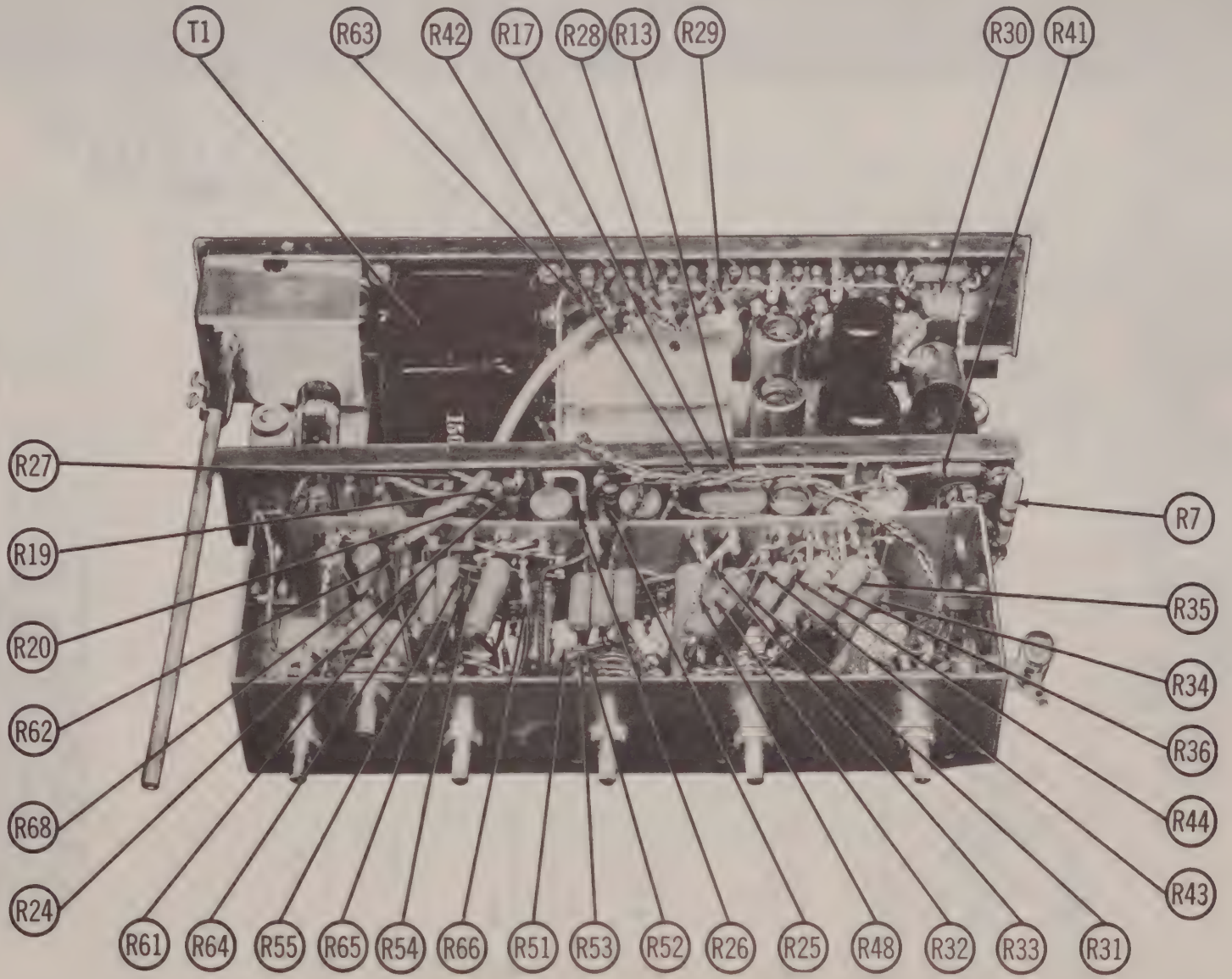
DENVER, COLORADO



CHASSIS TOP VIEW-RESISTOR IDENTIFICATION

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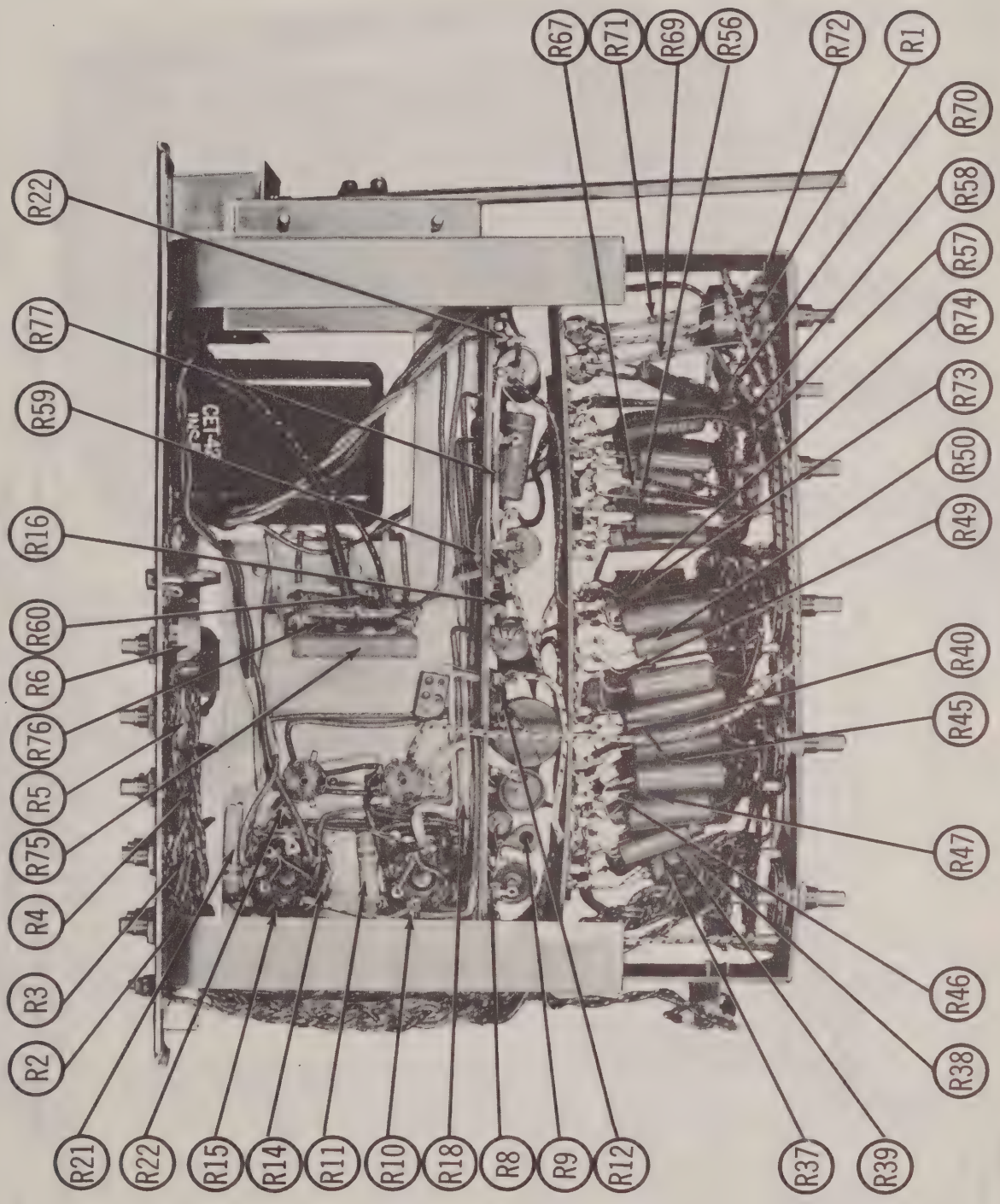
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: BROOK PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Pre. Amplifier	6J7	6J7	7R	
V2	Pre. Amplifier	6SJ7	6SJ7	8N	
V3	AF Amplifier	6SJ7	6SJ7	8N	
V4	AF Amplifier	6C4	6C4	6BG	
V5	AF Amplifier	6C4	6C4	6BG	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: BROOK PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	20	475								
B	20	475								
C	20	475								
D	40	50								
C2A	20	475								
B	20	475								
C	20	475								
C2D	40	50								
C3	50	50		PRS50/50				TC39	TVA-1308	
C4	1	450		PRS450/4					R1260	
C5	1	450		PRS450/4					R1260	
C6	50	500		1469-00005		5R5Q5		MCB225	MS-45	
C7	.02	600								
C8	.47	600								
C9	.1	200								
C10	.03	600								
C11	.03	600								
C12	.03	600								
C13	.03	600								Note 1
C14	.015	200								
C15	.036	200								
C16	.03	600								
C17	.02	200								
C18	.05	400								
C19	.003	200								
C20	.007	200								
C21	.02	200								
C22	.3	200								
C23	.15	200								
C24	.02	200								
C25	.1	600								
C26	.05	400								
C27	.068	200								
C28	.02	200								
C29	200	500		1469-0002		5W5T2		MCB237	MS-32	
C30	.5	400								
C31	.03	600								
C32	.1	200								
C33	.03	600								
C34	.03	600								
C35	.05	400								
C36	.02	200								
C37	.003	200								
C38	.01	600								
C39	.015	200								
C40	.02	200								
C41	.01	600								
C42	.005	200								
C43	.0015	200								

Note 1. Some Models use an .02MFD @ 600V in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: BROOK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ .21A	460VCT .014ADC	6.3VAC @ .58A	6.3VCT @ 1.38A					

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: BROOK PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	6271739	Q18-133X				Volume tapped at 100K and 200K
B	10KΩ	½	Not Req.	M11-116				Treble
R2A	250K	½	6151505	Q13-130	AG-60-Z	AB-51	U-44	Low gain Vol. #1
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	250K	½	6151505	Q13-130	AG-60-Z	AB-51	U-44	Low gain Vol. #2
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	250K	½	6151505	Q13-130	AG-60-Z	AB-51	U-44	Low gain Vol. #3
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	250K	½	6151505	Q13-130	AG-60-S	AB-51	U-44	Low gain Vol. #4
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	250K	½	U151505	Q13-130	AG-60-Z	AB-51	U-44	Phono Volume
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: BROOK PART No.	IRC PART No.	NOTES
R7	3000Ω	1			
R8	22K	½		BTS-22K	Note 1
R9	50KΩ	10			
R10	470KΩ	½		BTS-470K	
R11	1500Ω	1		BTA-1500	
R12	47KΩ	1		BTA-47K	
R13	1 Meg	½		BTS-1Meg	
R14	2. 2Meg	½		BTS-2. 2Meg	
R15	1500Ω	1		BTA-1500	
R16	47KΩ	1		BTA-47K	
R17	470KΩ	½		BTS-470K	
R18	1500Ω	1		BTA-1500	
R19	100KΩ	1		BTA-100K	
R20	27KΩ	1		BTA-27K	
R21	1500Ω	1		BTA-1500	
R22	470KΩ	½		BTA-470K	
R23	4700Ω	1		BTA-4700	
R24	10K	1		BTA-10K	
R25	10K	1		BTA-10K	
R26	22KΩ	½		BTS-22K	
R27	27KΩ	1		BTA-27K	
R28	2. 2Meg	½		BTS-2. 2Meg	
R29	2. 2Meg	½		BTS-2. 2Meg	
R30	47KΩ	½		BTS-47K	
R31	33KΩ	½		BTS-33K	
R32	100KΩ	½		BTS-100K	
R33	2. 2Meg	½		BTS-2. 2Meg	
R34	100KΩ	½		BTS-100K	
R35	2. 2Meg	½		BTS-. 2. 2Meg	
R36	100KΩ	½		BTS-100K	Note 2
R37	2. 2Meg	½		BTS-2. 2Meg	
R38	33KΩ	½		BTS-33K	
R39	2. 2Meg	½		BTS-2. 2Meg	
R40	2. 2Meg	½		BTS-2. 2Meg	
R41	10KΩ	1		BTA-10K	Note 4
R42	1000Ω	½		BTS-1000	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: BROOK PART No.	IRC PART No.	NOTES
R43	2. 2Meg	½		BTS-2. 2Meg	
R44	2. 2Meg	½		BTS-2. 2Meg	
R45	2. 2Meg	½		BTS-2. 2Meg	
R46	2. 2Meg	½		BTS-2. 2Meg	
R47	2. 2Meg	½		BTS-2. 2Meg	
R48	2. 2Meg	½		BTS-2. 2Meg	
R49	2. 2Meg	½		BTS-2. 2Meg	
R50	2. 2Meg	½		BTS-2. 2Meg	
R51	2. 2Meg	½		BTS-2. 2Meg	
R52	2. 2Meg	½		BTS-2. 2Meg	
R53	2. 2Meg	½		BTS-2. 2Meg	
R54	2. 2Meg	½		BTS-2. 2Meg	
R55	2. 2Meg	½		BTS-2. 2Meg	
R56	2. 2Meg	½		BTS-2. 2Meg	
R57	2. 2Meg	½		BTS-2. 2Meg	
R58	2. 2Meg	½		BTS-2. 2Meg	
R59	220Ω	½		BTS-220	
R60	220KΩ	½		BTS-220K	
R61	4700Ω	½		BTS-4700	
R62	4700Ω	½		BTS-4700	
R63	82Ω	½		BTS-82	
R64	2. 2Meg	½		BTS-2. 2Meg	
R65	2. 2Meg	½		BTS-2. 2Meg	
R66	2. 2Meg	½		BTS-2. 2Meg	
R67	2. 2Meg	½		BTS-2. 2Meg	
R68	470KΩ	½		BTS-470K	
R69	4700Ω	½		BTS-4700	
R70	22KΩ	½		BTS-22K	Note 3
R71	6800Ω	½		BTS-6800	
R72	150KΩ	½		BTS-150K	
R73	2. 2Meg	½		BTS-2. 2Meg	
R74	2. 2Meg	½		BTS-2. 2Meg	
R75	1000Ω	10		1 3/4A 1000	
R76	33KΩ	1		BTA-33K	
R77	2. 2Meg	½		BTS-2. 2Meg	

Note 1. Some models may use a 47KΩ resistor in this application.
Note 2. Some models may use a 150KΩ resistor in this application.
Note 3. Some models may use a 20KΩ resistor in this application.
Note 4. Some models may use a 33KΩ resistor in this application.

MISCELLANEOUS

ITEM No.	PART NAME	BROOK PART No.	NOTES
M1	Dial Light		#51
M2	Switch		Input Selector
M3	Switch		Playback characteristic control
M4	Switch		Bass control
M5	Switch		Treble Control
M6	Switch		Bass Compensation

PROPERTY OF
L. F. BLANKENSHIP
3914 MAPLE ST.
DENVER, COLORADO

CORONADO
MODEL RA37-43-9855

CORONADO
MODEL RA37-43-9855

TRADE NAME	Coronado Model RA37-43-9855
SUPPLIER	Gamble-Skogmo Inc., 15 N. 8th. St., Minneapolis, Minn.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3S4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 3 Volts "A" Supply & 67½ Volts "B" Supply
RATING	.12 Amp. @ 117 Volts AC (or) 150MA @ 3 Volts DC & 8MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal genrator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	Reassemble chassis in cabinet and place batteries in their proper position for more accurate alignment. With tuning gang fully closed set the dot under the small "5" of "55" on the dial directly opposite the gold index mark on the cabinet.						
3.		Loop	1600KC	1600KC	Across voice coil	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1500KC	Tune to 1500KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		CORONADO PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1U4	1U4	6AR	
V3	Det-AVC-AF-Amp.	1U5	1U5	6BW	
V4	Audio Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■40	150	521193	AFH3-74						
B	▲40	150								
C	250	15								
C2	.05	400	512214	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3	470		513008	SI470	D6-471		GP1K-471		5GA-T47	
C4	47		513002	SI47	D6-470		GP1K-470		5GA-Q47	
C5	10000		513022	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C6	.1	400	512217	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C7	10000		513022	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C8A	150		*521303	SI150	*PC-165		GP1K-151		5GA-T15	
B	2000			BPD-002			801-002		5HK-D2	
C	10000			BPD-01			811-01		5HK-S1	
D	150			SI150			GP1K-151		5GA-T15	
E	5000			BPD-005			811-005		5HK-D5	
C9	1500		513010	SI1500	D6-152		GP2K-152			
C10	.05	400	512214	P488-05		PTE4S5		PT415	4TM-S5	
C11	.05	400	512214	P488-05		PTE4S5		PT415	4TM-S5	

* Items C8A, C8B, C8C, C8D, C8E, R8A, R8B, R8C and R8D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CORONADO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	521218	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

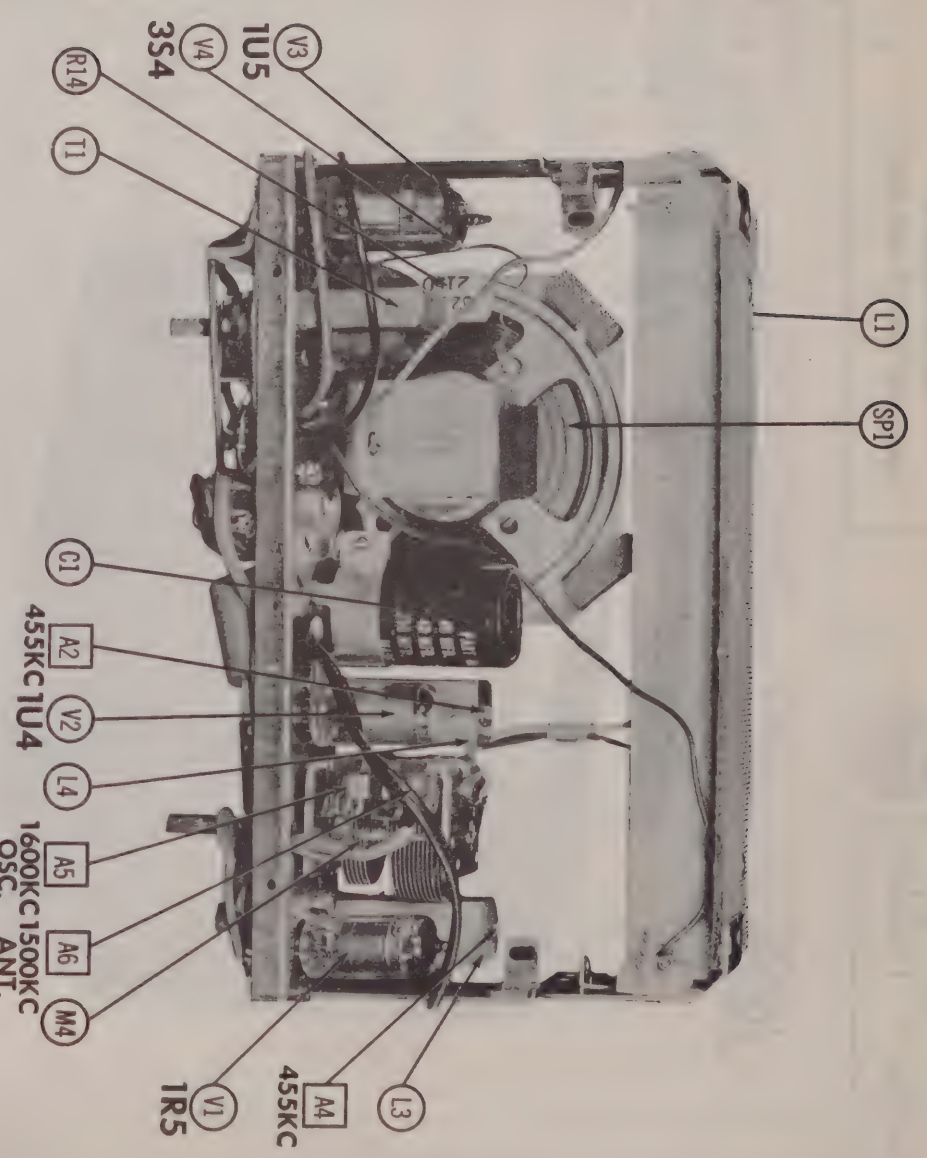
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CORONADO PART No.	IRC PART No.	
R2	4.7Meg	½	510195	BTS-4.7Meg	
R3	390Ω	½	510129	BTS-390	
R4	100KΩ	½	510173	BTS-100K	
R5	22KΩ	½	510161	BTS-22K	
R6	10Meg	½	510197	BTS-10Meg	
R7	3.3Meg	½	510194	BTS-3.3Meg	
R8A	10Meg	½		BTS-10Meg	
B	4.7Meg	½	♦ 521303	BTS-4.7Meg	
C	1 Meg	½		BTS-1Meg	
D	3.3Meg	½		BTS-3.3Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CORONADO PART No.	IRC PART No.	
R9	270Ω	½	510126	BTS-270	
R10	680Ω	½	510133	BTS-680	
R11	27Ω	½	510108	BTS-27	
R12	220KΩ	½	510179	BTS-220K	
R13	680Ω	½	510133	BTS-680	
R14A	2000Ω	7	521210		
B	150Ω	3			
R15	3300Ω	½	510146	BTS-3300	

♦ Items R8A, R8B, R8C, R8D, C8A, C8B, C8C, C8D, C8E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		CORONADO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	5.3KΩ	3.1Ω	528Ω	.47Ω	521266		A-3026①			① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.1Ω	521365	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.6Ω		521375				Includes mounting board.
L2	Osc. Coil	2Ω	9Ω	521224	14-1060		71-Osc.	
L3	Input IF	24Ω	24Ω	521318	16-6758	BC-352	12-C1	
L4	Output IF	42Ω	42Ω	521319	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				
	CURRENT	CORONADO PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.070ADC	508305	5M4	1003	6S75	75

BATTERIES

ITEM No.	VOLTAGE	CORONADO PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1½V	43-272	964			2IR			2 Used in series
M3	67½V.	43-310		477			P45		

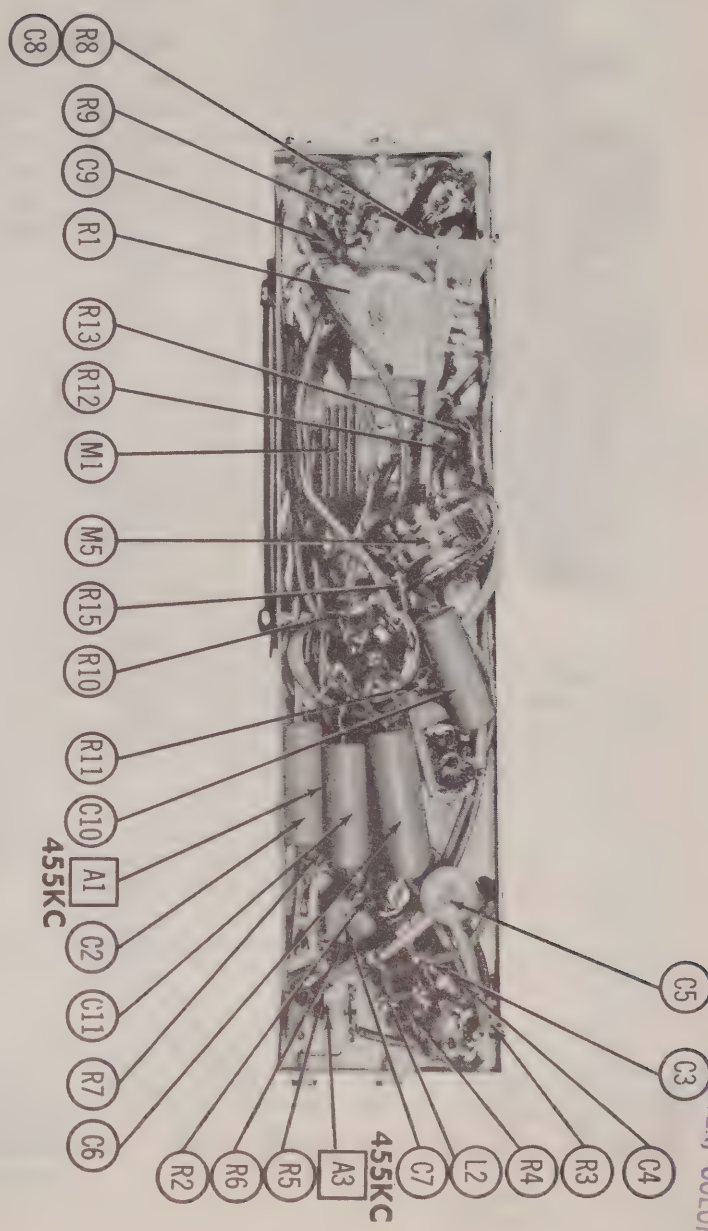
MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M4	Tuning Cap	521294	2 gang (16-287 MMF, 12-100MMF)
M5	Switch	521293	Power selector
	Cabinet	521679	Fron t section (with latch & baffle)
	Cabinet	521680	Back Section
	Escutcheon	521422	
	Handle	521420	
	Knob	521418	Off-on volume
	Knob	521419	Tuning & dial scale

SET 227 FOLDER 5

CORONADO
MODEL RA37-43-9855

CHASSIS—BOTTOM VIEW



CORONADO
MODEL RA37-43-9855
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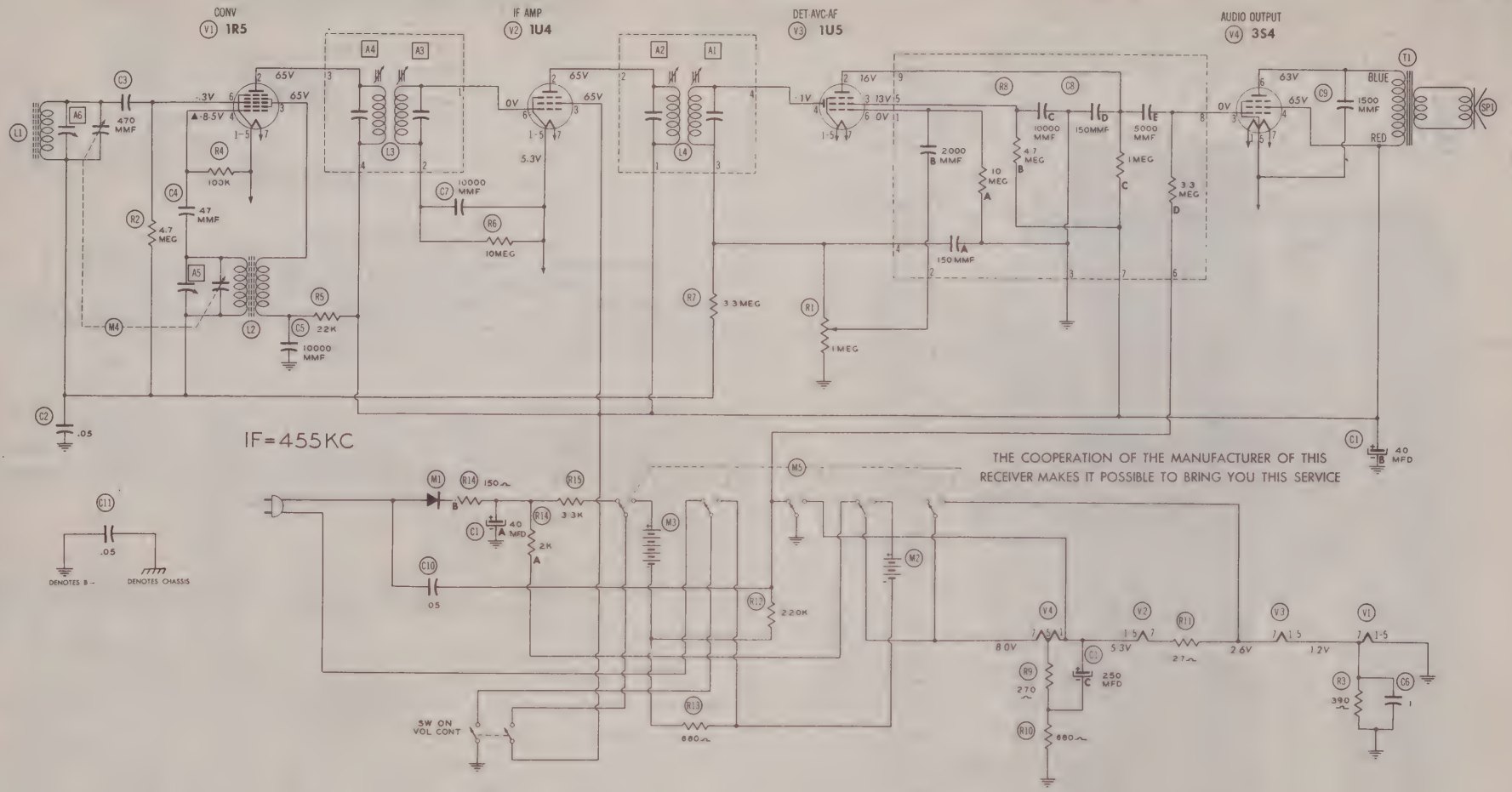

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0Ω	†3.5KΩ	†25.5KΩ	100KΩ	0Ω	9Meg	*
V 2	1U4	*	†3.5KΩ	†3.5KΩ	0Ω	*	10Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	INF	10Meg	*
V 4	3S4	*	INF	3.3Meg	†3.5KΩ	*	†4KΩ	*

▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1 WITH OFF/ON SWITCH CLOSED

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RETMA MEMBER

DAVID BOGEN
MODELS EQR, LCS, R701

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L. F. BLANKENSHIP
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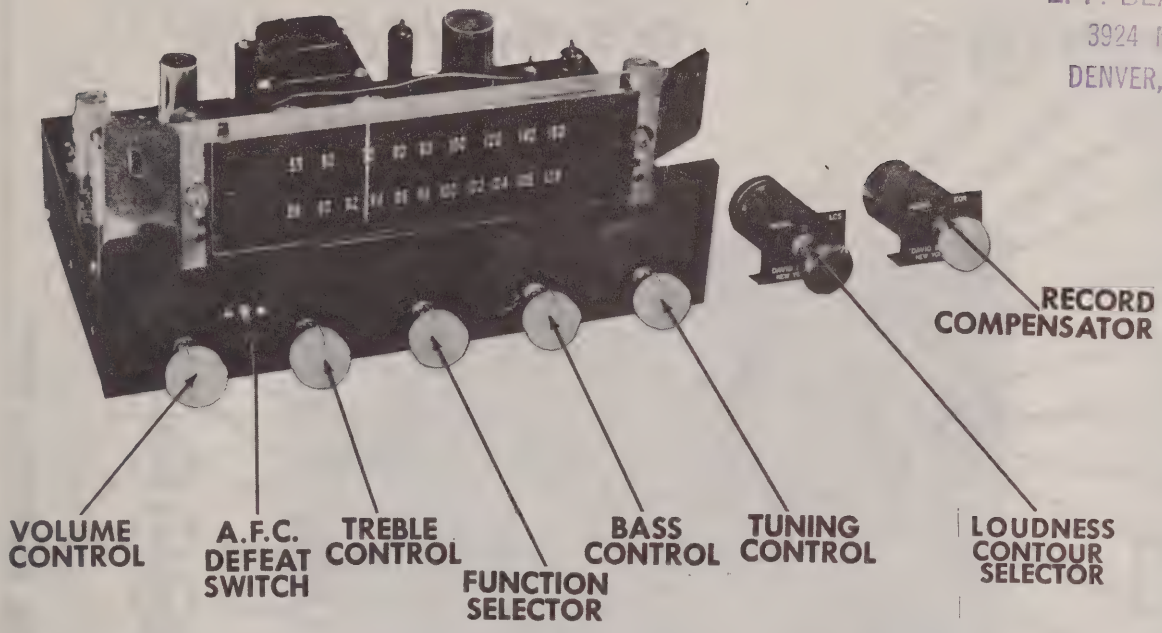
DAVID BOGEN
MODELS EQR, LCS, R701



DAVID BOGEN
MODELS EQR, LCS, R701

TRADE NAME	David Bogen Models EQR (Record Compensator), LCS (Loudness Control Selector), R701 (AM-FM Tuner	
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York 14, N.Y.	
TYPE SET	AC Operated AM-FM Superheterodyne Tuner with Record Compensation & Loudness Control Accessories	
TUBES	Fourteen	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .45 Amp. @ 117 Volts AC
TUNING RANGE- BROADCAST	530-1650KC	FREQ.MOD. 88-108MC

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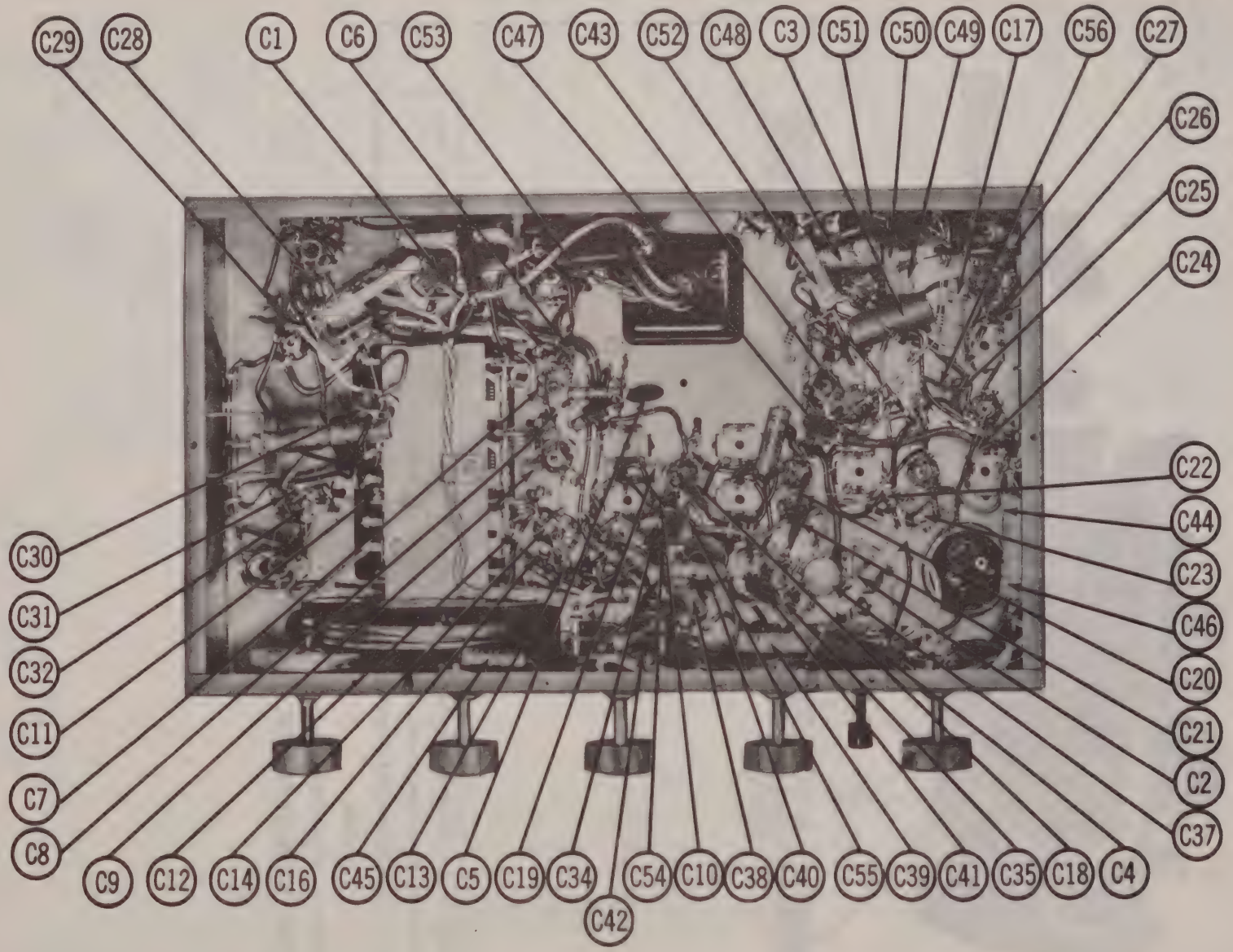
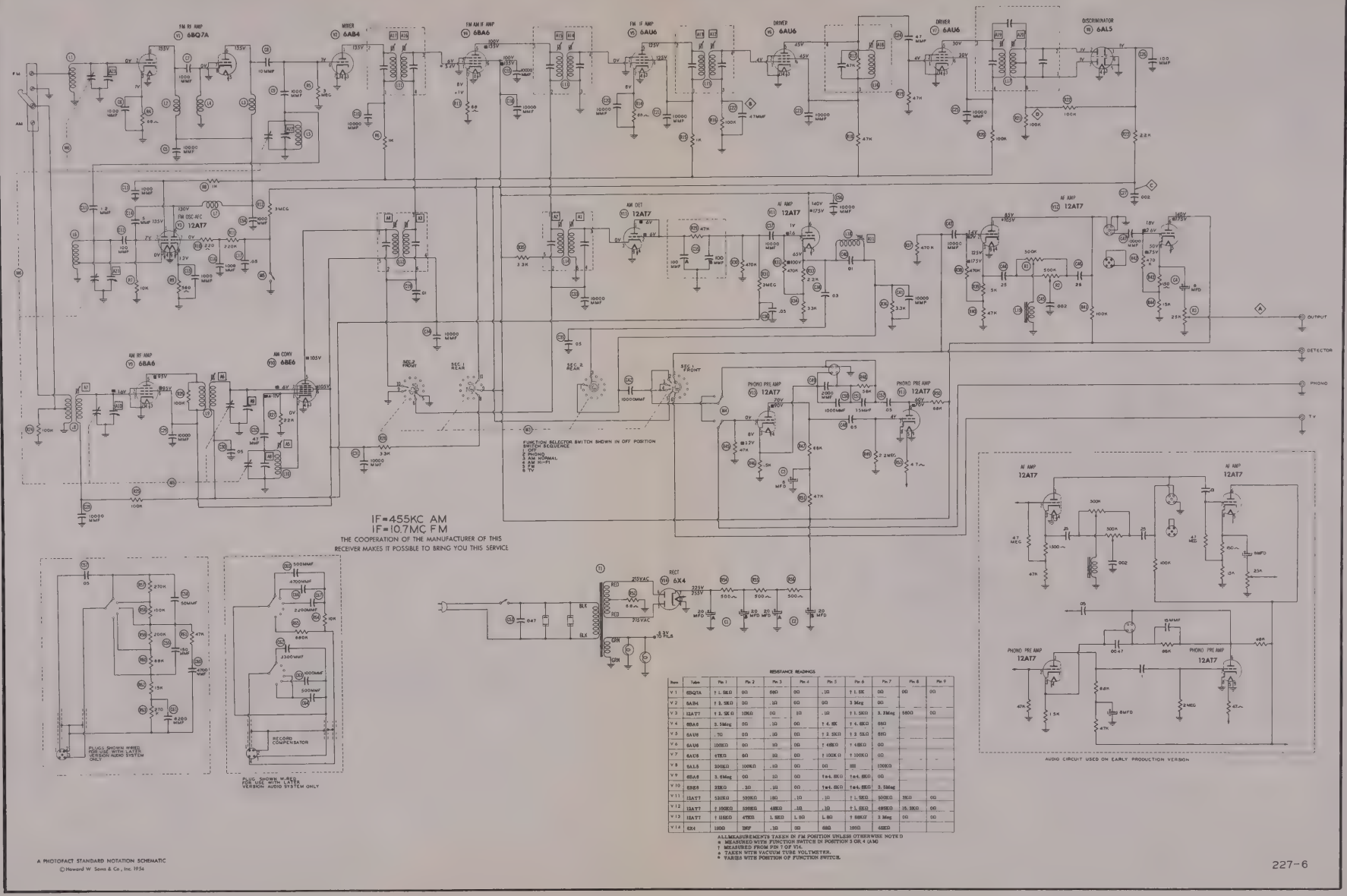


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	† 1. 5KΩ	0Ω	68Ω	0Ω	.1Ω	† 1. 5K	0Ω	0Ω	0Ω
V 2	6AB4	† 1. 5KΩ	0Ω	.1Ω	0Ω	0Ω	3 Meg	0Ω		
V 3	12AT7	† 2. 5K Ω	10KΩ	0Ω	.1Ω	.1Ω	† 1. 5KΩ	3. 3Meg	580Ω	0Ω
V 4	6BA6	3. 5Meg	0Ω	.1Ω	0Ω	† 4. 8K	† 4. 8KΩ	68Ω		
V 5	6AU6	.7Ω	0Ω	.1Ω	0Ω	† 2. 5KΩ	† 2. 5KΩ	68Ω		
V 6	6AU6	100KΩ	0Ω	.1Ω	0Ω	† 48Ω	† 48Ω	0Ω		
V 7	6AU6	47KΩ	0Ω	.1Ω	0Ω	† 100KΩ	† 100KΩ	0Ω		
V 8	6AL5	300KΩ	100KΩ	.1Ω	0Ω	0Ω	0Ω	150KΩ		
V 9	6BA6	3. 6Meg	0Ω	.1Ω	0Ω	† 4. 8KΩ	† 4. 8KΩ	0Ω		
V 10	6BE6	22KΩ	.2Ω	.1Ω	0Ω	† 4. 8KΩ	† 4. 8KΩ	3. 3Meg		
V 11	12AT7	510KΩ	100KΩ	1Ω	.1Ω	.1Ω	† 1. 5KΩ	100KΩ	1KΩ	0Ω
V 12	12AT7	† 100KΩ	100KΩ	68KΩ	.1Ω	.1Ω	† 1. 5KΩ	68KΩ	15. 2KΩ	0Ω
V 13	12AT7	† 100KΩ	47KΩ	1. 5KΩ	1. 5Ω	1. 5Ω	† 68KΩ	3. 3Meg	0Ω	0Ω
V 14	6X4	180Ω	INF	.1Ω	0Ω	68Ω	180Ω	68KΩ		

ALL MEASUREMENTS TAKEN IN FM POSITION UNLESS OTHERWISE NOTED
= MEASURED WITH FUNCTION SWITCH IN POSITION 3 OR 4 (AM)
† MEASURED FROM PIN 7 OF V14.
* TAKEN WITH VACUUM TUBE VOLTMETER.
* VARIES WITH POSITION OF FUNCTION SWITCH.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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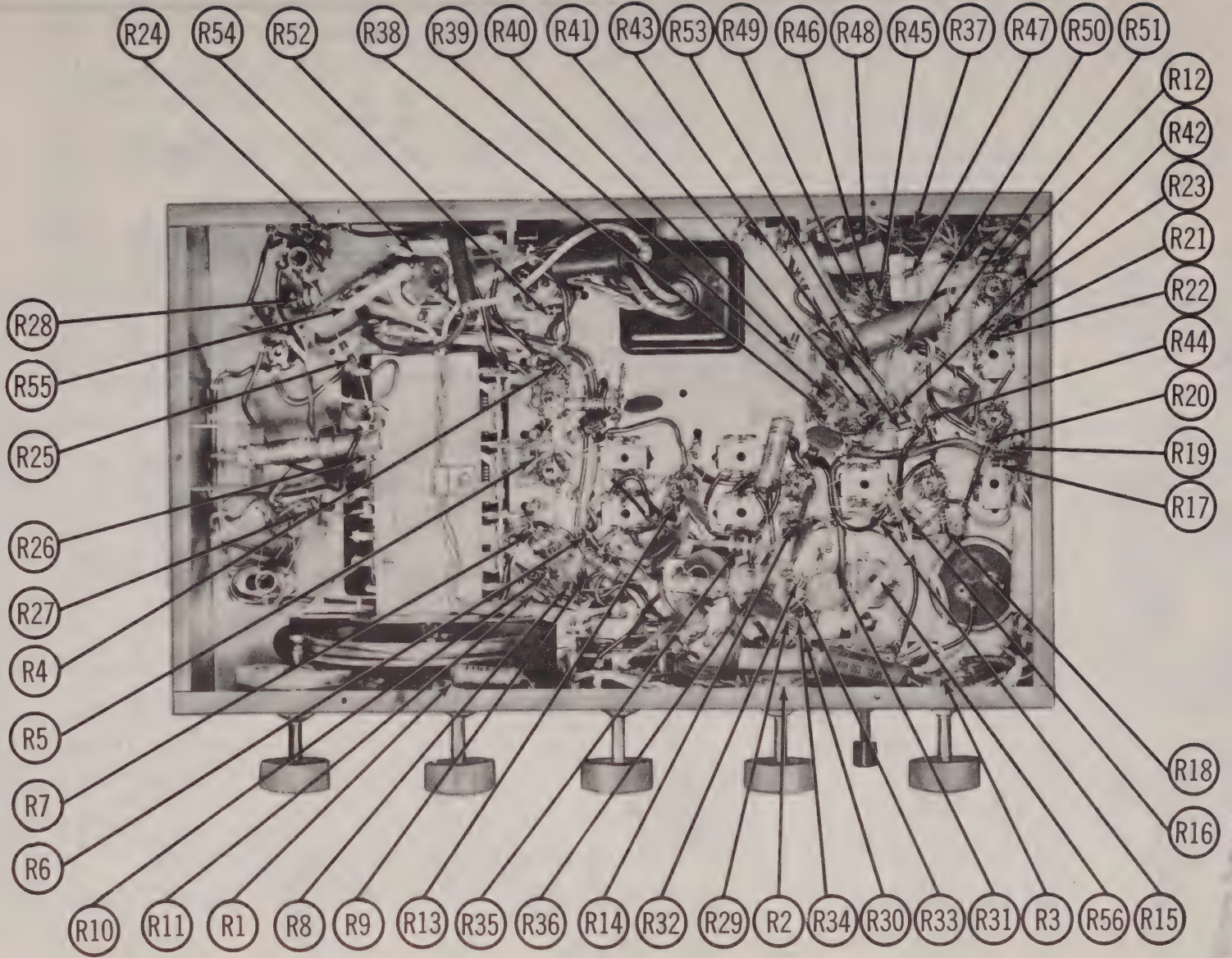
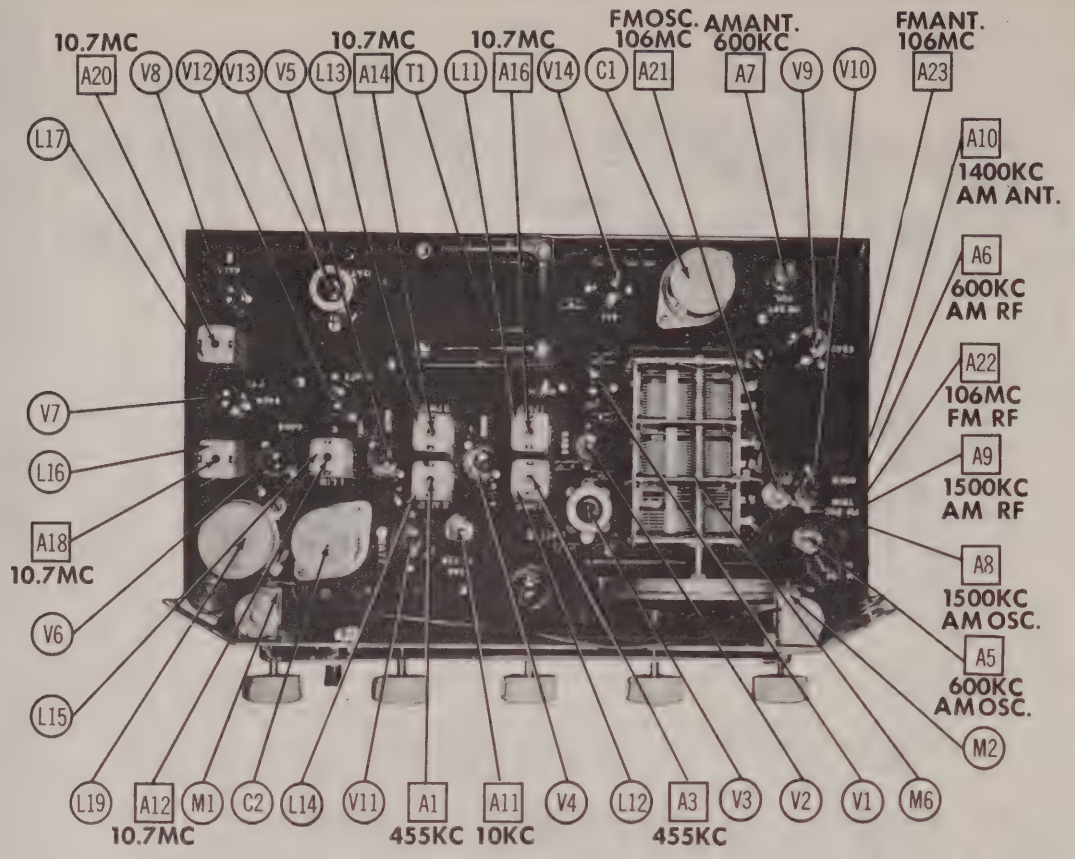
227-6

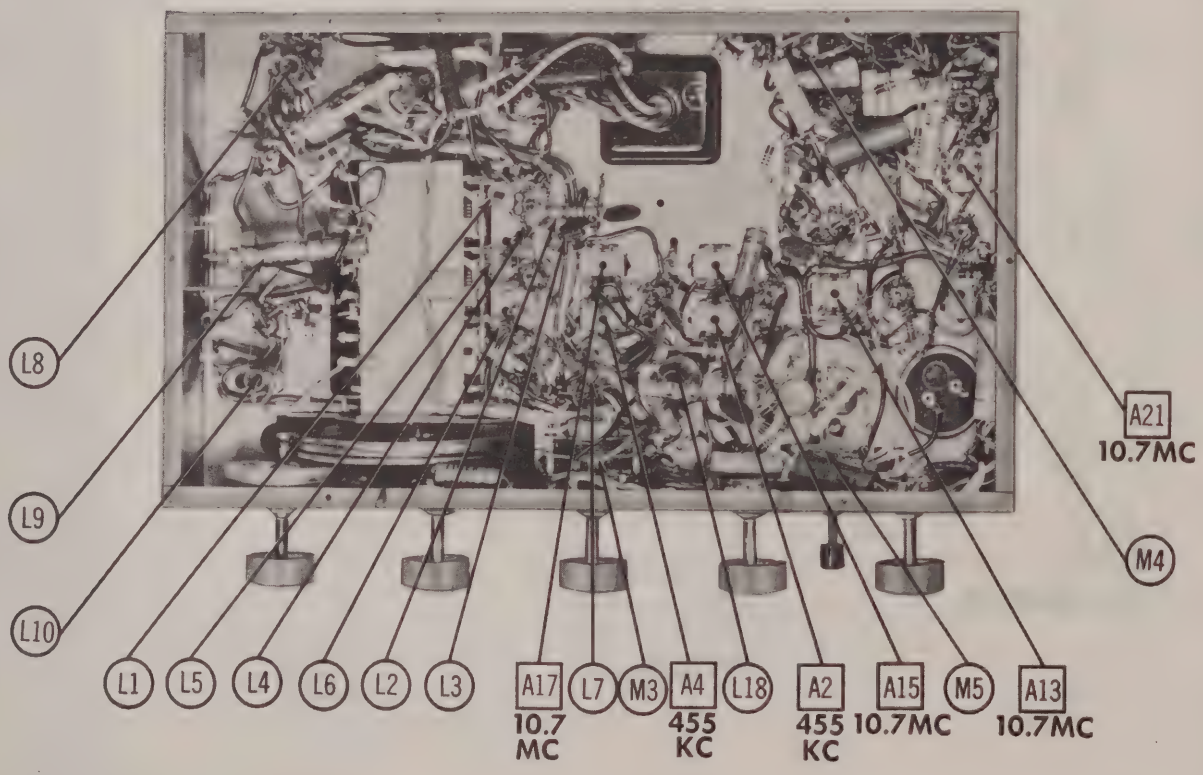


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

DAVID BOGEN
MODEL 701



CHASSIS TOP VIEW



CHASSIS-BOTTOM INDUCTOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V10). Low side to chassis.	455KC (400∿Mod)	AM Normal	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum output.
2.	200MMF	High side to AM antenna terminal. Low side to chassis.	600KC	"	600KC	"	A5, A6 A7	"
3.	"	"	1500KC	"	1500KC	"	A8, A9, A10	"
4.	Repeat steps 2 and 3.							
5.	.01MFD	High side to pin 7 (grid) of 12AT7 (V11). Low side to chassis.	10KC (Unmod)	"		"	A11	Adjust for MINIMUM output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 1 (grid) of 6BA6 (V4). Low side to chassis.	10.7MC	FM	Point of non-interference	DC probe thru 100KΩ to point Ⓑ. Common to chassis	A12, A13 A14, A15 A16, A17	Adjust for maximum output.
7.	"	"	"	"	"	DC probe thru 1Meg resistor to point Ⓓ. Common to chassis.	A18, A19	"
8.	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A20	Adjust for zero reading. A positive and negative will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 1 (grid) of 6BA6 (V4). Low side to chassis.	10.7MC	FM	Point of non-interference	High side thru 100kΩ to point Ⓑ. Low side to chassis.	A12, A13 A14, A15 A16, A17	Adjust for maximum amplitude and symmetry as in Fig. 1.
7.	"	"	"	"	"	High side thru 100KΩ to point Ⓓ. Low side to chassis.	A16, A17	"
8.	"	"	"	"	"	High side thru 100KΩ to point Ⓒ. Low side to chassis.	A18	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A16 and A17 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	300Ω Carbon Resistor	High side to FM antenna terminal. Low side to chassis.	106MC	FM	106MC	DC probe thru 100KΩ to point Ⓑ. Common to chassis	A21, A22 A23	Adjust for maximum output.
10.	"	"	90MC	"	90MC			Check tracking. If necessary repeat step 9.

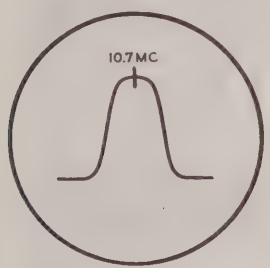


FIG. 1

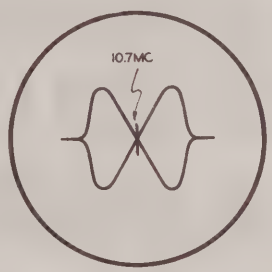
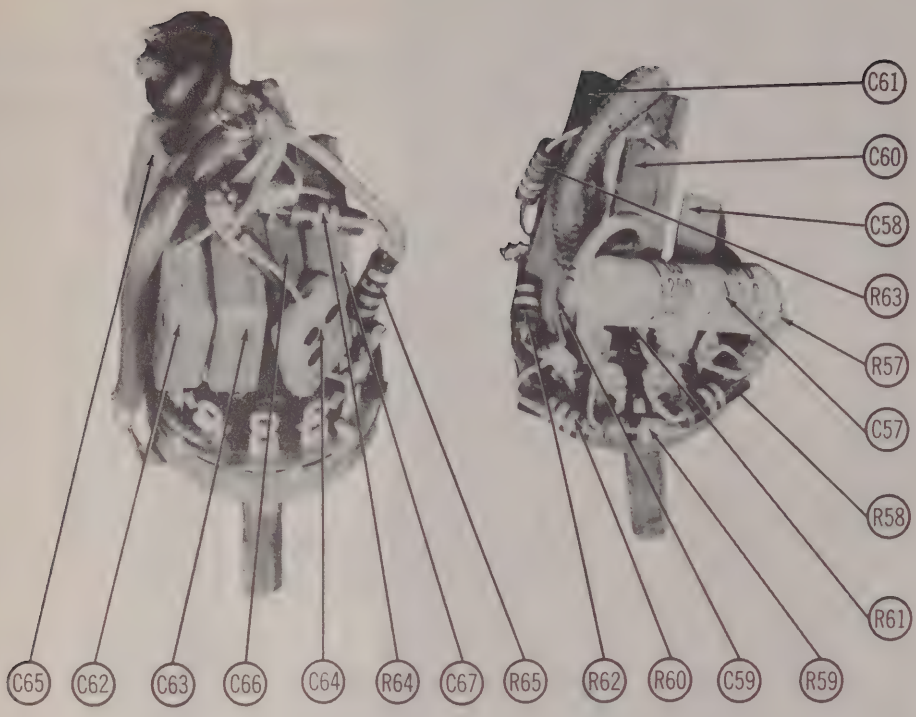
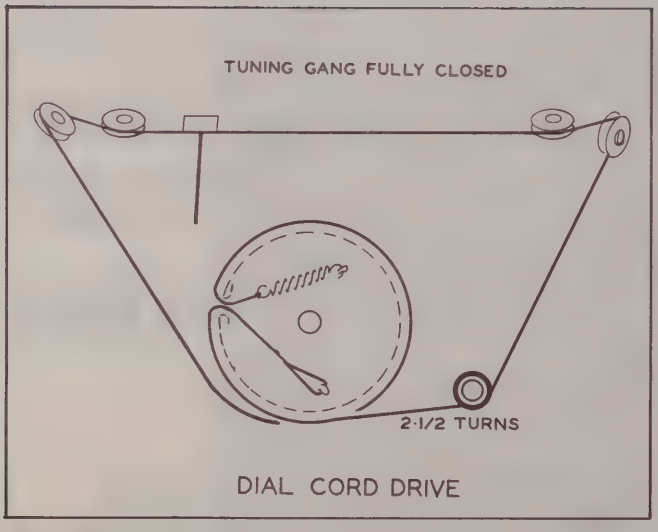


FIG. 2



MODELS EQR & LCS



DIAL CORD DRIVE

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C21	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C22	47			SI47	D6-470		GP1K-470	UC-5447	10GA-Q47	
C23	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C24	47			SI47	D6-470		GP1K-470	UC-5447	10GA-Q47	
C25	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C26	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C27	.002	600		P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C28	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C29	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C30	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C31	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C32	47			SI47	D6-470		GP1K-470	UC-5447	10GA-Q47	
C33	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C34	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C35A	100		♦	♦PA97	♦PC-50	TM5T1	♦1403-01	UC-531	♦100C1	
B	100					TM5T1		UC-531		
C36	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	Note 1
C37	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C38	.03	200		P488-03		PTE4S3		PT413	4TM-S3	
C39	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C40	.01	200		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C41	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C42	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C43	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C44	.25	200		P488-25		PTE4P25		PT4025	2TM-P25	
C45	.002	600		P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C46	.25	200		P488-25		PTE4P25		PT4025	2TM-P25	
C47	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C48	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C49	2000	500		1467-002	D6-202	1W5D2	GP2-333-202		1FM-22	Note 2
C50	1000	500		1467-001	D6-102	1W5D1	GP2L-102		1FM-21	Note 2
C51	35									Note 3
C52	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C53	.047	400		489ZX-047		PTE4S47		PT4147	4TM-S47	Note 4
C54	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5GA-D1	
C55	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	Note 1
C56	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	Note 1
C57	.05	200		P488-05		PTE4S5		PT215	4TM-S5	
C58	50	500		1468-00005		5W5Q5		MC225	1FM-45	
C59	150	500		1468-00015		5W5T15		MC236	1FM-315	
C60	4700	500		1467-005		1D5D5		MC465		
C61	8200	500		1441-008		1D3D8		MC471		
C62	3300	500		1479-001						
C63	1000	500		1479-001		2R5D1		MCE251	MS-21	
C64	500	500		1479-0005		5R5T5		MCE243	MS-35	
C65	500	500		1479-0005		5R5T5		MCE243	MS-35	
C66	4700	500								
C67	2200	500								

Note 1. Not used in all Models.
Note 2. Some Models combined C49 and C50 in one .0033MFD unit.
Note 3. Some Models use 22MMF in this application.
Note 4. Some Models use .1MFD Ⓐ 600V. in this application.
♦ C35A, C35B and R29 are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	David Bogen PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500KΩ	½	V-311A	Q17-133		B-61		Bass
R2	500KΩ	½	V-311A	Q17-133		B-61		Treble
R3	25KΩ	½	V-313					Volume

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	David Bogen PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC Ⓐ.45A	400VCT .053ADC	6.3VAC Ⓐ3.5A		T-380	PC-8420①			

① Drill new mounting holes.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	David Bogen PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Coil	0Ω		U-402				Tapped
L2	RF Choke	.8Ω		U-501			4602	1μh, (IRC part #CLA)
L3	RF Choke	.8Ω		U-501			4602	1μh, (IRC part #CLA)
L4	Parasitic Supp.	0Ω		U-504				.06Microhenry
L5	FM RF Coil	0Ω		U-401				
L6	FM Osc. Coil	0Ω		U-405				Tapped
L7	RF Choke	.8Ω		U-501			4602	1μh, (IRC part #CLA)
L8	AM Ant. Coil	32Ω	2.6Ω	U-304				Tapped Ⓐ .1Ω
L9	AM RF Coil	70Ω	3Ω	U-301				
L10	AM Osc. Coil	2.2Ω		U-303			71-Osc.	Tapped Ⓐ .2Ω
L11	1st FM IF	.6Ω	.6Ω	H-294	16-3487	FM-254	1463	
L12	1st AM IF	18Ω	18Ω	H-368				
L13	2nd FM IF	.7Ω	.7Ω	H-355	16-3487	FM-254	1463	
L14	2nd AM IF	18Ω	18Ω	H-368				
L15	3rd FM IF	.7Ω	.7Ω	H-355	16-3487	FM-254 .	1463	
L16	4th FM IF	.6Ω		H-371	16-3487 *	FM-254 *	1463 *	
L17	FM Discrim.	.7Ω	.9ΩCT	H-295	17-3484 †	FM-253	1464	
L18	10KC Filter	120Ω		U-201				
L19	Bass Tone Choke	1500Ω		T550-3				

* Detune unused winding.
† Cut out chassis hole and drill mounting holes.

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M1	Dial Light		Type #47
M2	Dial Light		Type #47
M3	Switch	S-380	Off-Phono-AM normal-AM Hi-Fi-FM-TV function
M4	Switch	S-381	Phono Magnetic - Crystal
M5	Switch	S-382	AFC Defeat
M6	Tuning Cap.	C-620	Ant. 34-517MMF, RF 34-517MMF, Osc. 32-192MMF

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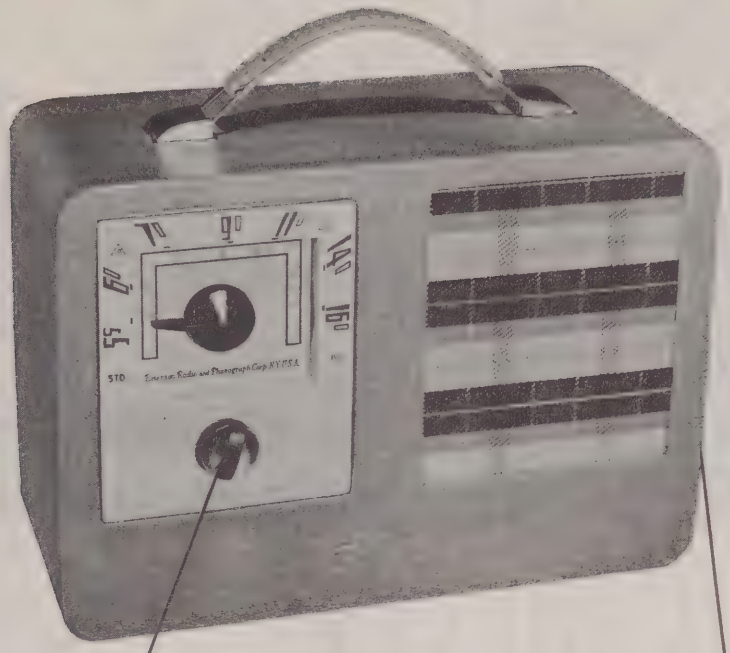
3924 MEADE ST.
DENVER, COLORADO

EMERSON
MODEL 745B (Ch. 120176-B)



TUNING CONTROL

ON-OFF SWITCH
VOLUME CONTROL

EMERSON
MODEL 745B (Ch. 120176-B)

TRADE NAME	Emerson Model 745B (Ch. 120176-B)
MANUFACTURER	Emerson Radio & Phono Corp., 111 8th. Ave., New York, N.Y.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Five)	Types 1U4 RF Amp., 1L6 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	105-125 Volts AC-DC (Or) 9 Volts "A" Supply & 90 Volts "B" Supply in Pack Form
RATING	.11 Amp. @ 117 Volts AC (or) 50MA @ 9 Volts DC & 13MA @ 90 Volts DC
TUNING RANGE—BROADCAST	

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFDcapacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Chassis undercover must be in place when performing steps 2 thru 5.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1L6 (V2). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1640KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1420KC	Tune to 1420KC signal	"	A6, A7	"
4.		"	530KC	Tuning gang fully closed	"	A8, A9	"
5.	Repeat steps 2, 3 and 4.						

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

EMERSON
MODEL 745B (Ch. 120176-B)

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	1U4	1U4	6AR	
V2	Converter	1L6	1L6	7DC	
V3	IF Amplifier	1U4	1U4	6AR	
V4	Det-AVC-AF-Amp	1U5	1U5	6BW	
V5	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲80	150	925239					FP362.7		
B	■40	150								
C	▲300	25								
C2	.1	200	923315	P288-1	DF-104	PTE4P1		PT401	2TM-P1	
C3	10000		928027	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C4	270		928075	SI270	D6-271		GP2K-271			
C5	.05	200	923354	P288-05	DF-503	PTE4S5		PT415	2TM-S5	
C6	270		928075	SI270	D6-271		GP2K-271			
C7	.1	200	923315	P288-1	DF-104	PTE4P1		PT415	2TM-P1	
C8	10000		928027	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C9	10000		928027	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C10	10000		928027	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C11	.1	200	923315	P288-1	DF-104	PTE4P1		PT415	2TM-P1	
C12	5000		928109	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C13A	5000					TM5D5		DC-525		
B	100		*923027	*PA-117	*PC-91	TM5T1	*1407-03	UC-531	*103C3	
C	5000					TM5D5		DC-525		
C14	.005	600	923753	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C15	.047	460	922200	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C16	.05	200	923554	P288-05		PTE4S5		PT415	2TM-S5	
C17	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	

* Items C12A, C12B, C12C, R13A, R13B and R13C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	390224	Q13-137	AG-63-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

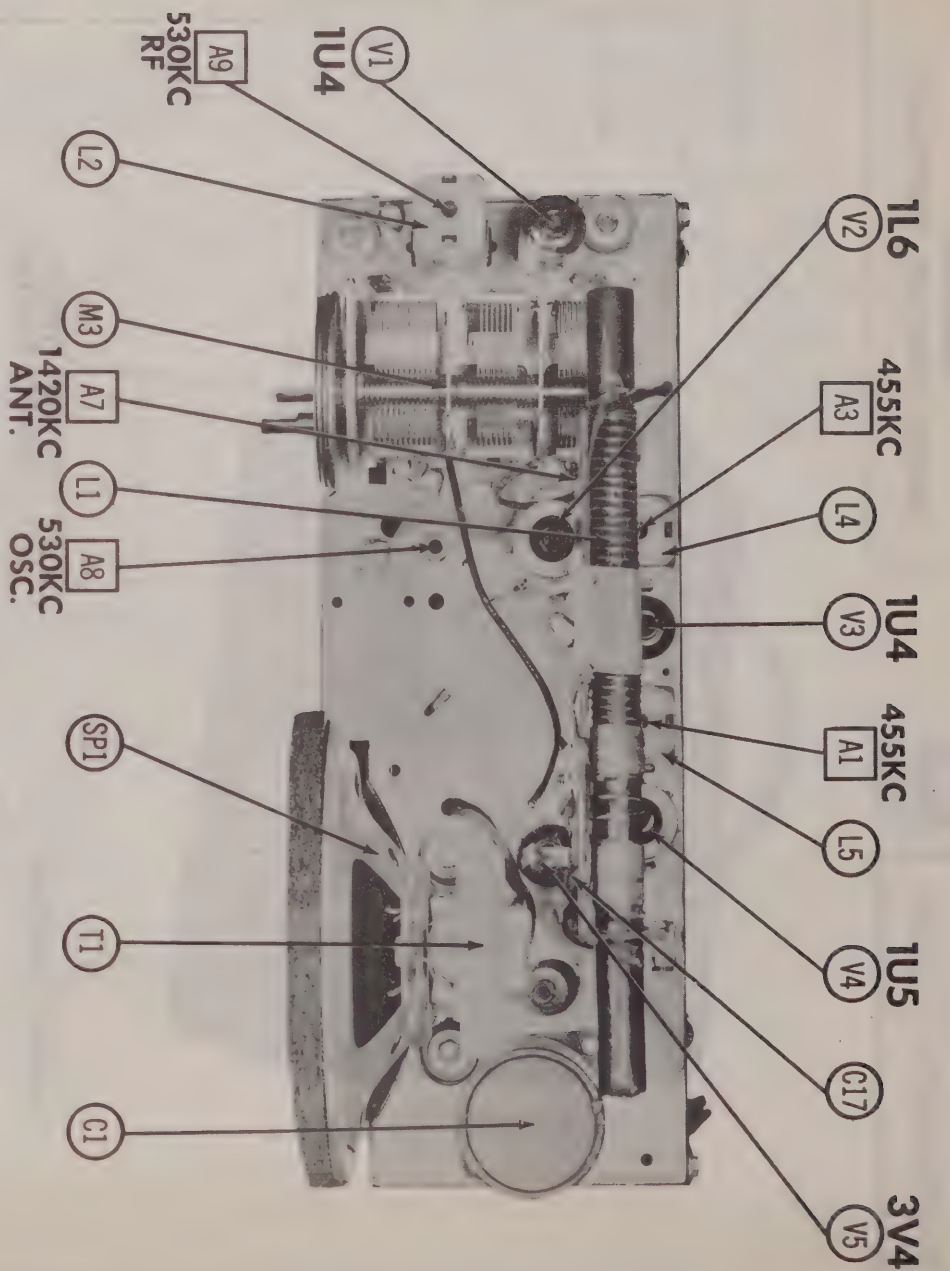
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	NOTES
R2	1Meg	½	351212	BTS-1Meg	
R3	2. 7Meg	½	341312	BTS-2. 7Meg	
R4	3. 3Meg	½	351332	BTS-3. 3Meg	
R5	1Meg	½	351212	BTS-1Meg	
R6	220KΩ	½	341052	BTS-220K	
R7	68KΩ	½	340932	BTS-68K	
R8	3. 3Meg	½	351332	BTS-3. 3Meg	
R9	1000Ω	½	340492	BTS-1000	
R10	3. 3Meg	½	351332	BTS-3. 3Meg	
R11	47KΩ	½	340892	BTS-47K	
R12	10Meg	½	351452	BTS-10Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	NOTES
R13A	4. 7Meg	½		BTS-4. 7Meg	
B	1 Meg	½	♦ 923027	BTS-1Meg	
C	2. 2Meg	½		BTS-2. 2Meg	
R14	220K	½	341052	BTS-220K	
R15	470Ω	½	340412	BTS-470	
R16	1500Ω	½	340532	BTS-1500	
R17	1800Ω	½	340552	BTS-1800	
R18	1500Ω	½	340532	BTS-1500	
R19	120Ω	3	394018		
R20	1500Ω	½	340532	BTS-1500	
R21	2200Ω	10	394095	1 3/4A-2250	

♦ Items R13A, R13B, R13C, C12A, C12B, C12C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	8.3KΩ	3.2Ω	394Ω	.66Ω	Part of Spkr.	A-3329	A-2927 ①	RO-30X①	S-11X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.2Ω	180100	ST-105 Mod. P5-X	5A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.1Ω	.7Ω	700082				
L2	RF Coil	85Ω	7Ω	713031				
L3	Osc. Coil	1.6Ω	8Ω	716077	14-1073		69-Osc.	
L4	Input IF	17Ω	17Ω	720033	16-6758	BC-352	12-C1	
L5	Output IF	14Ω	14Ω	720076	16-6770	BC-355	12-C6	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				
	CURRENT	EMERSON PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.065	817025	5M4	1003	6S75	75

BATTERIES

ITEM No.	VOLTAGE	EMERSON PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V "A" 90V "B"				756			T6Z60	

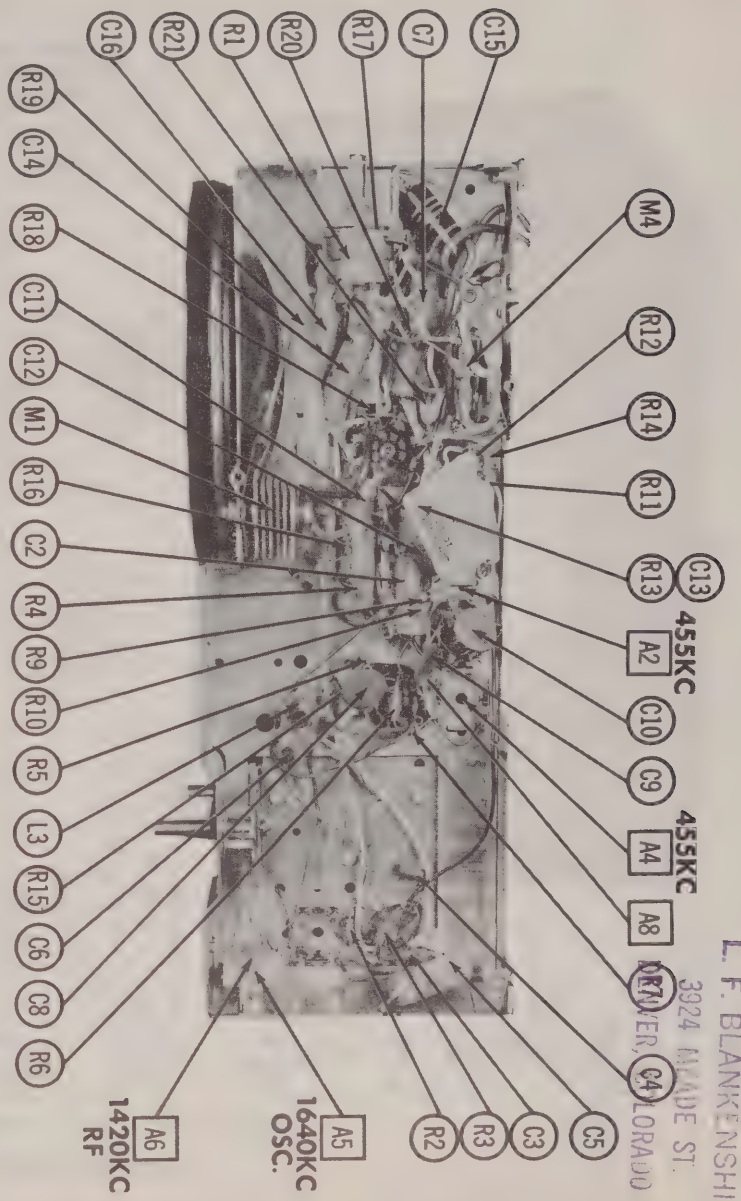
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Tuning cap	90095	3 gang (28-382MMF, 9-362MMF, 8-135MMF)
M4	Switch	510095	Power Selector
A5, A6	Trimmer cap	900058	Dual section-R. F. & Osc. adj.
	Cabinet	140513	
	Knob	460088	Off-on volume
	Knob	450158	Tuning
	Pointer	525068	Dial

TUNING GANG FULLY OPEN

DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



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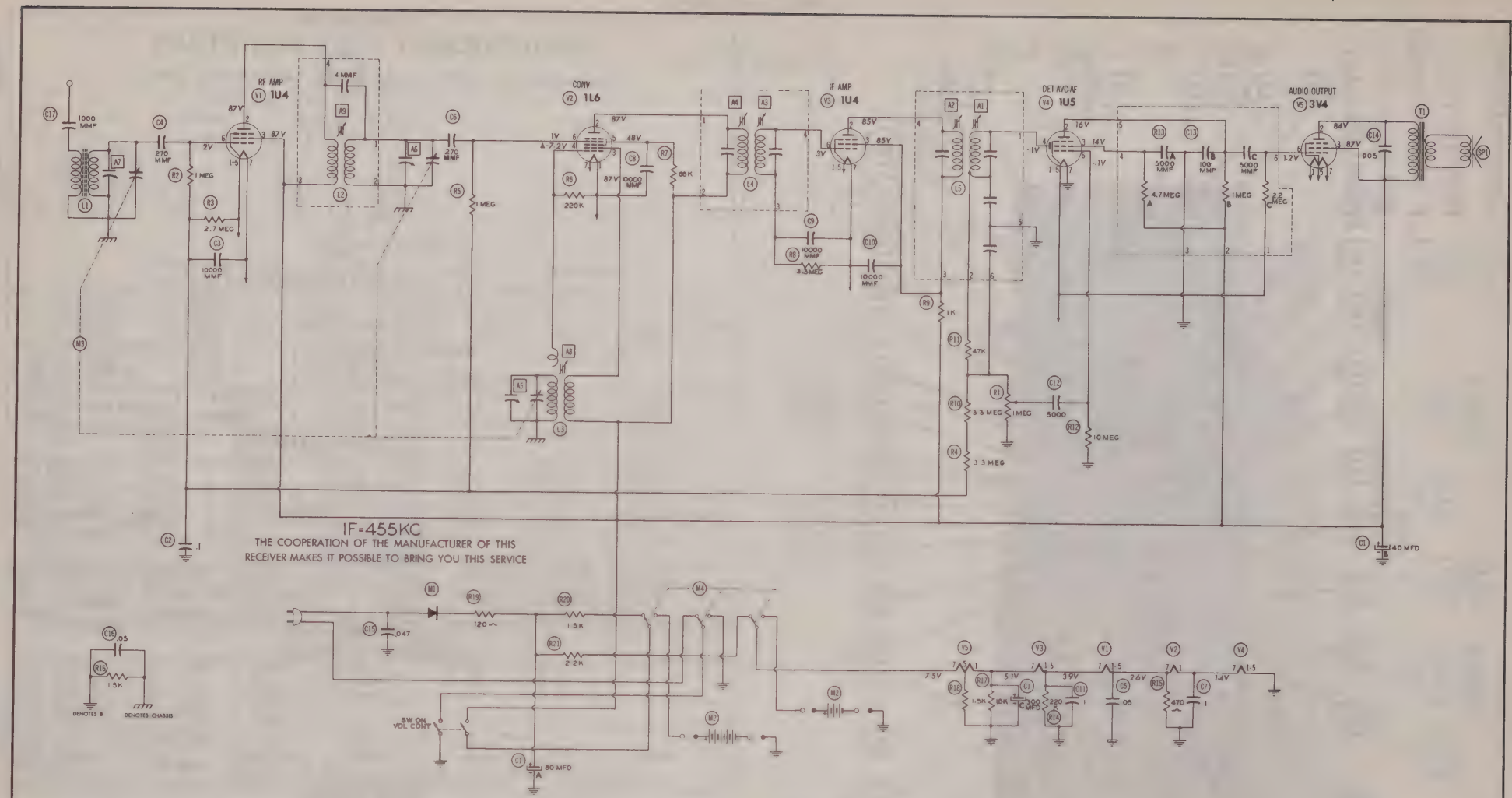
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

EMERSON
MODEL 745B (Ch. 120176-B)


RF AMP V1 1U4
CONV V2 1L6
IF AMP V3 1U4
DET AVC/AF V4 1U5
AUDIO OUTPUT V5 3V4
IF=455KC
THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
SW ON VOL CONT
DENOTES B
DENOTES CHASSIS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V-1	1U4	*	†1.6KΩ	†1.6KΩ	2Meg	*	3Meg	*
V-2	1L6	*	†1.6KΩ	†1.6KΩ	220KΩ	†70KΩ	3.5Meg	*
V-3	1U4	*	†2.6KΩ	†2.6KΩ	INF	*	3.3Meg	*
V-4	1U5	0Ω	†1Meg	†4.7Meg	1Meg	†1.6KΩ	10Meg	*
V-5	3V4	*	†2KΩ	†1.6KΩ	0Ω	*	2.2Meg	*

▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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227-7

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

HALLICRAFTERS
MODELS 5R230, 5R231, 5R232 (Run 1)

PROPERTY OF
L. F.
DENVER, COLORADO

TRADE NAME	Hallicrafters Models 5R230, 5R231, 5R232 (Run 1)
MANUFACTURER	Hallicrafters Co., 4401 W. 5th. Ave., Chicago 24, Ill.
TYPE SET	AC-DC Operated 2-Band AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC
SHORT WAVE	1.79 -4.1MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to antenna stator lug of tuning gang. Low side to B-.	455KC (400%Mod)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	"	A5	"
3.		Loop	600KC	"	Tune to 600KC signal	"		Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Move coil on loop stick SLIGHTLY to left or right. Install set in cabinet with loop stick in place.
4.		"	1400KC	"	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
5.	390Ω Carbon Resistor	High side to external antenna terminal. Low side to B-.	4.1MC (400%Mod)	SW	Tuning gang fully open	"	A7	Adjust for maximum deflection.
6.		Loop	3.6MC	"	Tune to 3.6MC signal	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■50	150	45B230	AFH2-15		BO15		FP213	TVL-2432	
B	▲30	150								
C2	20	25	45A235	SRE25/25		BR202A				
C3	.047	600	46BR473L4	P688-047	DF-503	PTE6S47		PT615	6TM-S47	
C4	.01	600	46BR103J6	P688-01	D6-103	PTE6S1	GP2-333-103	PT411	4TM-S1	
C5	700	500	47A349			2R5T7			MS-37	
C6	47		47B20A470K5	SI47	D6-470		GP1K-470	UC-5447	5TCU-Q47	
C7	.047	200	46BS473L2	P288-047	DF-503	PTE4S2		PT415	4TM-S47	
C8A	220									
B	2000									
C	*		*49A027	*PA-113-1	*PC-150		*1468-01		*103C4	
D	5000									
E	*									
C9	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C10	.047	400	46BS473L6	489ZX-047		PTE4S47		PT415	4TM-S47	
C11	1.2		47A160-3							Note

Note . Not used in all Models.
* Items C8A, C8B, C8C, C8D, C8E, R4A, R4B and R4C are combined in one unit.
When replacing items separately items C8C and C8E should total 250MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Hallicrafters PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	25C1043	Q13-133	AG-60-Z	AB-60	U-48	Volume - Note
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	KB-1	US-26	Attach to R1A

Note: Some models may use control No. 25C1041

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	Hallicrafters PART No.	IRC PART No.	NOTES
R2A	25KΩ	½	♦ 49C030	BTS-25K	
B	3.3Meg	½		BTS-3.3Meg	
C	220Ω	½		BTS-220	
D	150Ω	½		BTS-150	
R3	470KΩ	½	23X20X474K	BTS-470K	

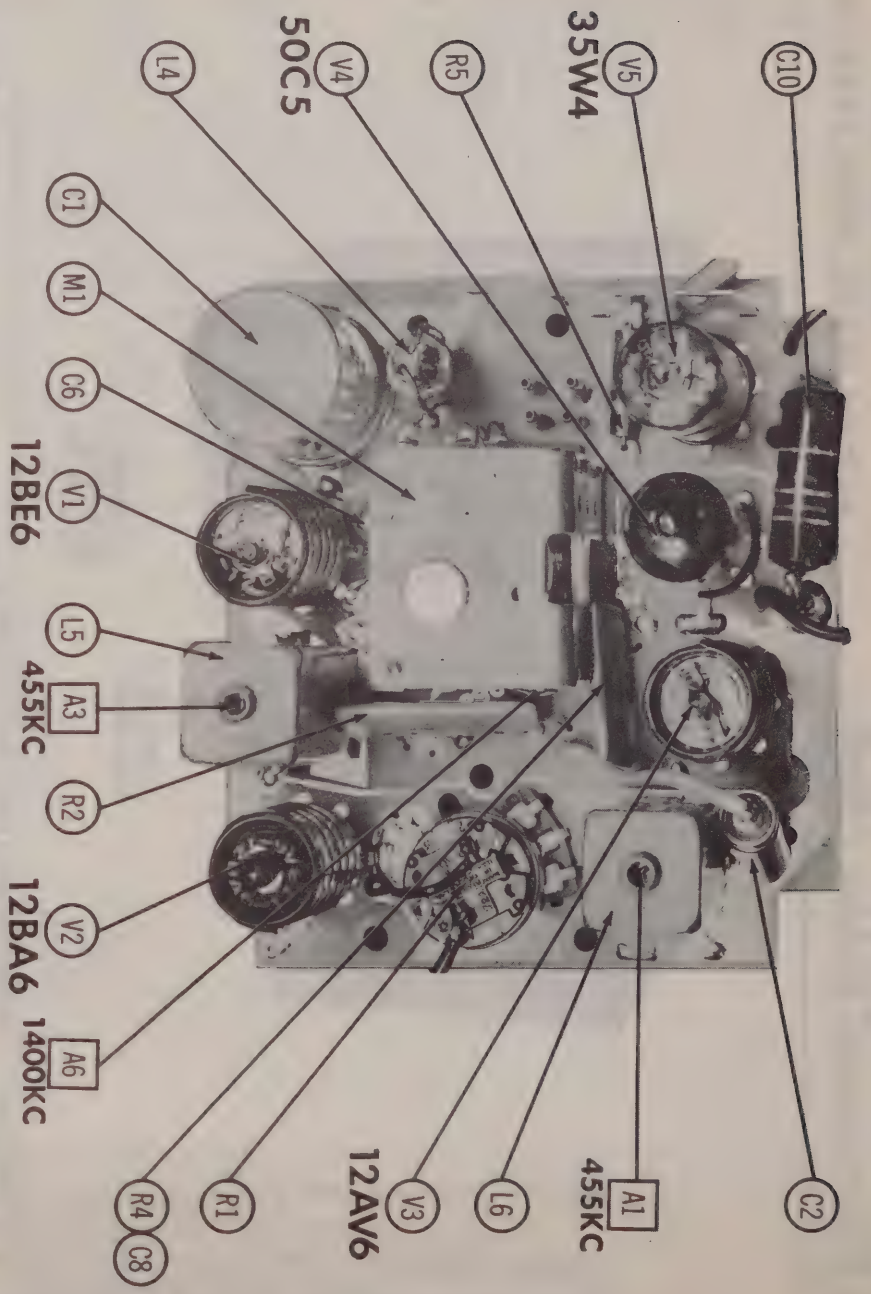
ITEM No.	Hallicrafters RATING OHMS	Hallicrafters RATING WATT	Hallicrafters PART No.	IRC PART No.	NOTES
R4A	6.8Meg	½	† 49A027	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R5	1000Ω	1	23X30X120K	BTA-1000	

† Items R4A, R4B, R4C, C8A, C8B, C8C, C8D, C8E are combined in one unit.
♦ Items R2A, R2B, R2C, R2D are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	Hallicrafters PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2.4KΩ	3.2Ω	135Ω	.3Ω	Part of Spkr.	A-3332	A-3025	RO-302 ①	S-1X ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Hallicrafters PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	85C146	ST-113 Mod. P4-X	4A07	

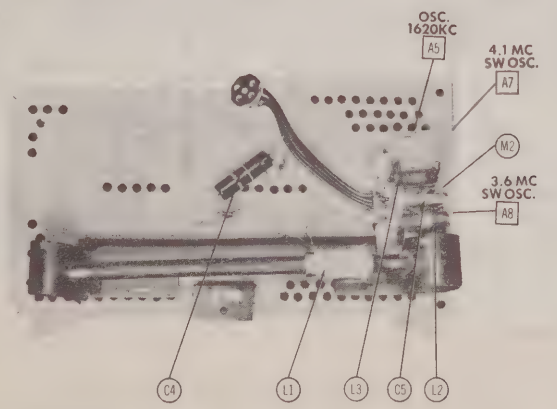
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Hallicrafters PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	BC Ant. Coil	1Ω		57C195				Tapped @ .1Ω
L2	SW Ant. Coil	2.8Ω		51B1670				
L3	SW Osc. Coil	2.5Ω		51B1668				
L4	BC Osc. Coil	.5Ω	7Ω	51B1665	14-1074		70-Osc. †	
L5	Input IF	13Ω	13Ω	50C597	16-6758	BC-352	12-C1	
L6	Output IF	13Ω	13Ω	50C597	16-6758	BC-353	12-C2	

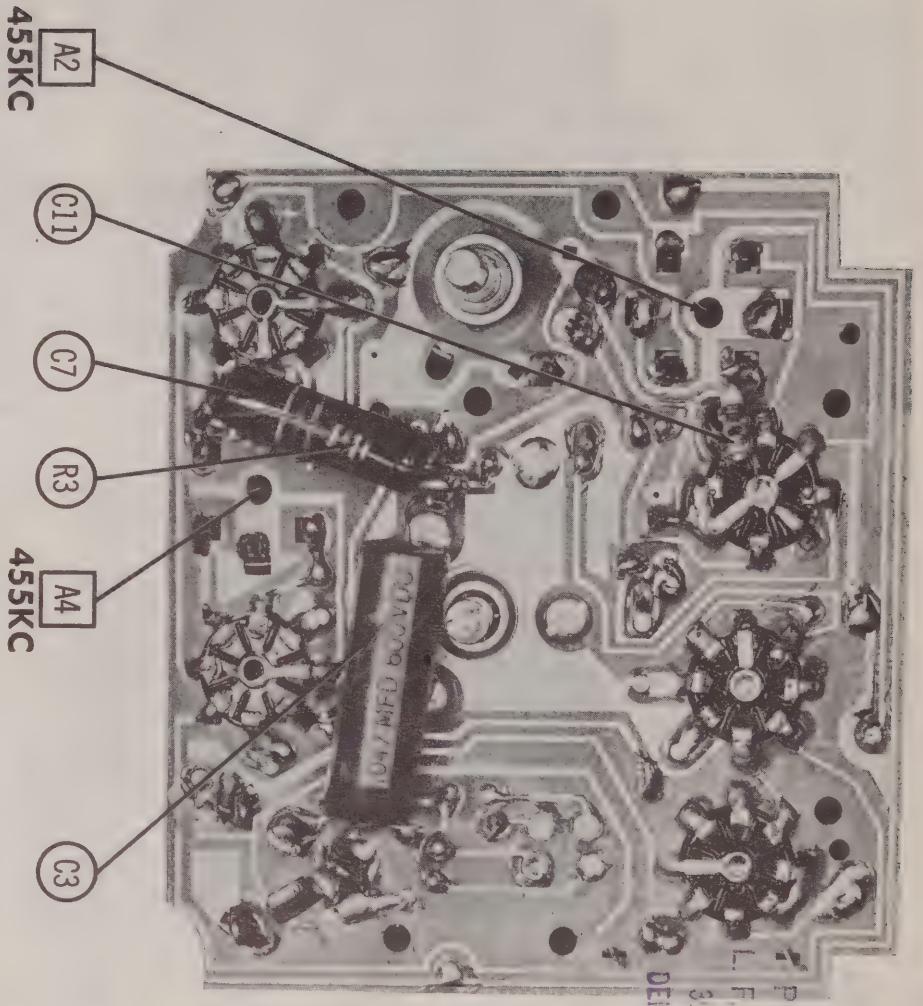
† Disregard tap on secondary winding.

MISCELLANEOUS

ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M1	Tuning cap	48D310	2 gang (16-357 MMF, 7-130MMF)
M2	Switch	60B544	Slide-B. C. -S. W. (mounted on back cover)
A5	Trimmer cap	44B441	2-24MMF
A7, A8	Trimmer cap	44B389	Antenna-2 used (1-5 MMF)
	Cabinet	116F038	Model 5R230-maroon
	Cabinet	116A040	Model 5R231-white
	Cabinet	116A042	Model 5R232-blue
	Knob	15A636	Volume-maroon
	Knob	15A613	Volume-white
	Knob	15A619	Volume-blue
	Knob	15C601	Tuning-front maroon
	Knob	15A609	Tuning-front-white
	Knob	15A620	Tuning-front-blue
	Knob	15A622	Tuning-rear-maroon
	Knob	15A623	Tuning-rear-white
	Knob	15A621	Tuning-rear-blue
	Back cover	8D221l	Less stick loop antenna
	Dial scale	83C438	
	Printed circuit	130D002	Main chassis (less all parts except tube sockets, eyelets and 4-pin plug).
	Printed circuit	13A003	Shortwave chassis (less all parts).

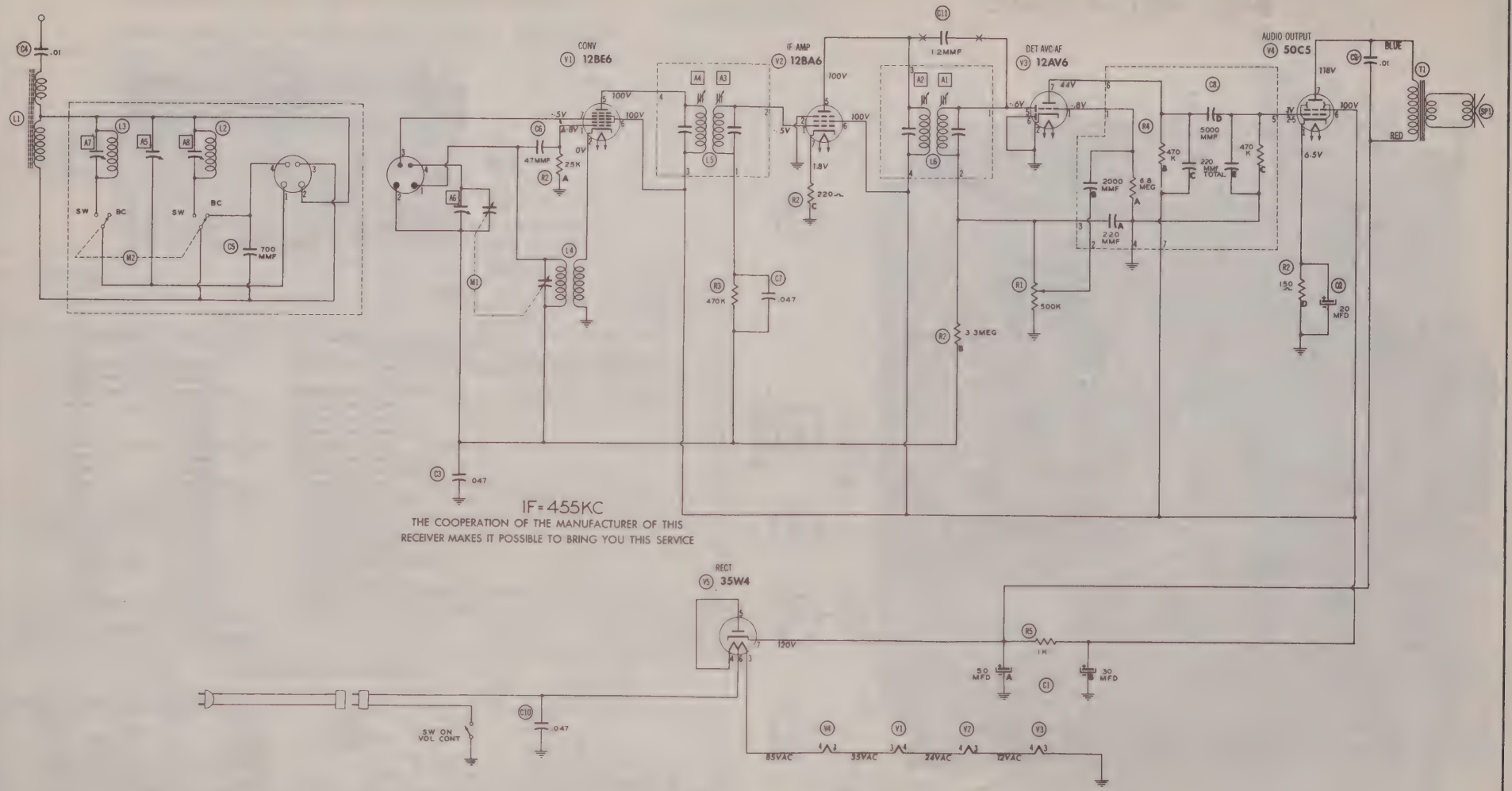


CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HALLICRAFTERS MODEL 5R230 (Rum 1)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	25KΩ	.5Ω	42Ω	28Ω	†1KΩ	†1KΩ	3.8Meg
V 2	12BA6	4.3Meg	0Ω	28Ω	14Ω	†1KΩ	†1KΩ	220Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	14Ω	500KΩ	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	42Ω	110Ω	470KΩ	†1KΩ	†135Ω
V 5	35W4	INF	INF	110Ω	160Ω	160Ω	150Ω	70KΩ

† MEASURED FROM PIN 7 OF V5
Δ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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227-8

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RETMA MEMBER

McGOHAN MODEL WA-312

PROPERTY OF
L. F. [illegible]
3924 [illegible]
DENVER, COLORADO

McGOHAN
MODEL WA-312

McGOHAN
MODEL WA-312

TRADE NAME	Don McGohan Model WA-312
MANUFACTURER	Don McGohan, Inc., 3700 W. Roosevelt Rd., Chicago 24, Ill.
TYPE SET	AC Operated Audio Amplifier
TUBES (Five)	Types 12AU7 Pre-AMp., 12AU7 Phase Inv., (2) 6V6GT Audio Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .66 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

DON McGOHAN
MODEL WA-312

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		Don McGohan PART No.	STANDARD REPLACEMENT		
V1	Pre-Amplifier	12AU7	12AU7	9A	
V2	Phase Inverter	12AU7	12AU7	9A	
V3	Audio Output	6V6GT	6V6GT	7S	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Don McGohan PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲30	450		AFH4-82		DO78		FP237 TC495	TVL-3743	
B	■30	450								
C	▲125	25								
C2A	▲30	450		AFH4-82		DO78		FP237 TC495	TVL-3743	
B	■30	450								
C	▲125	25								
C3	.05	600		P688-05	DF-503	PTE685		PT605	6TM-S5	
C4	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C5	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	

RESISTORS

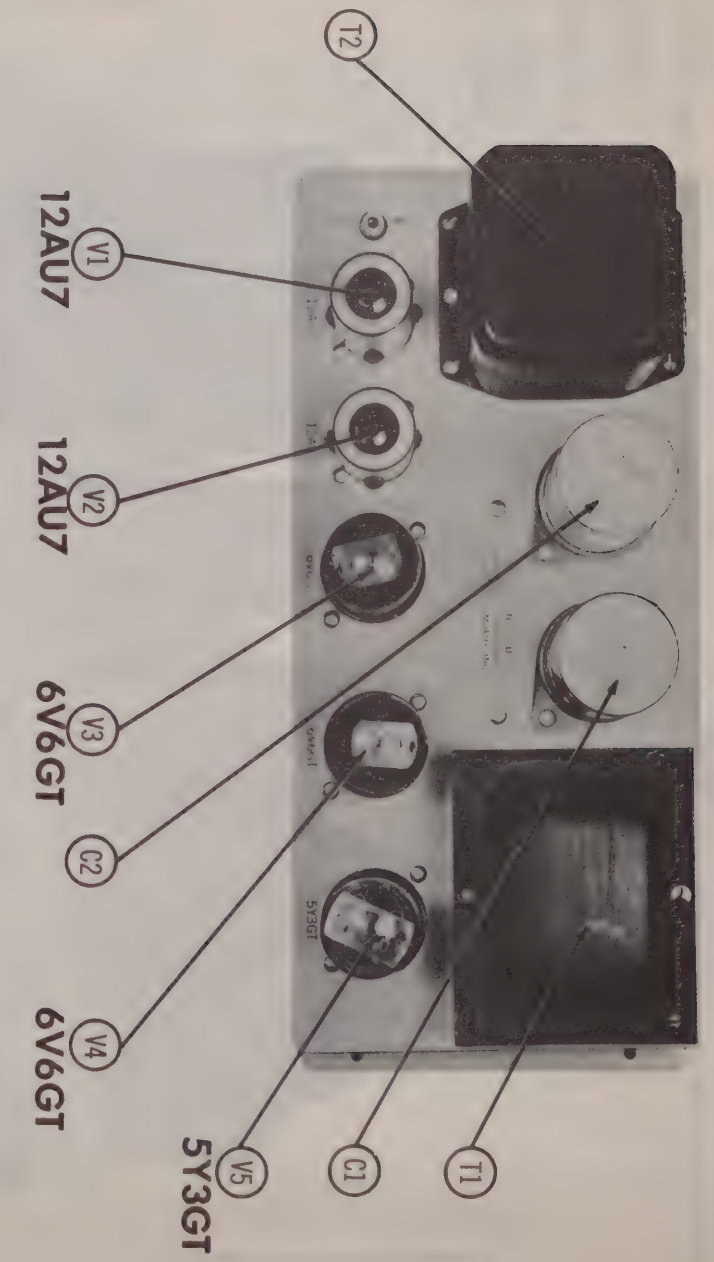
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Don McGohan PART No.	IRC PART No.	
R1	470KΩ	½		BTS-470K	
R2	6800Ω	½		BTS-6800	
R3	100KΩ	½		BTS-100K	
R4	470KΩ	½		BTS-470K	
R5	4700KΩ	½		BTS-4700	
R6	4700Ω	½		BTS-4700	
R7	220KΩ	½		BTS-220K	
R8	47KΩ	1		BTA-47K	
R9	47KΩ	1		BTA-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Don McGohan PART No.	IRC PART No.	
R10	1000Ω	½		BTS-1000	
R11	330KΩ	½		BTS-330K	
R12	300Ω	2			
R13	330KΩ	½		BTS-220K	
R14	1000Ω	½		BTS-1000	
R15	1000Ω	½		BTS-1000	
R16	2500Ω	1		BTA-2500	
R17	1000Ω	1		BTA-1000	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	Don McGohan PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC ⓑ.66A	696VCT .082ADC	5VAC ⓐ2A	6.3VCT ⓐ2A		PM-8409	P-2952		R-11B

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

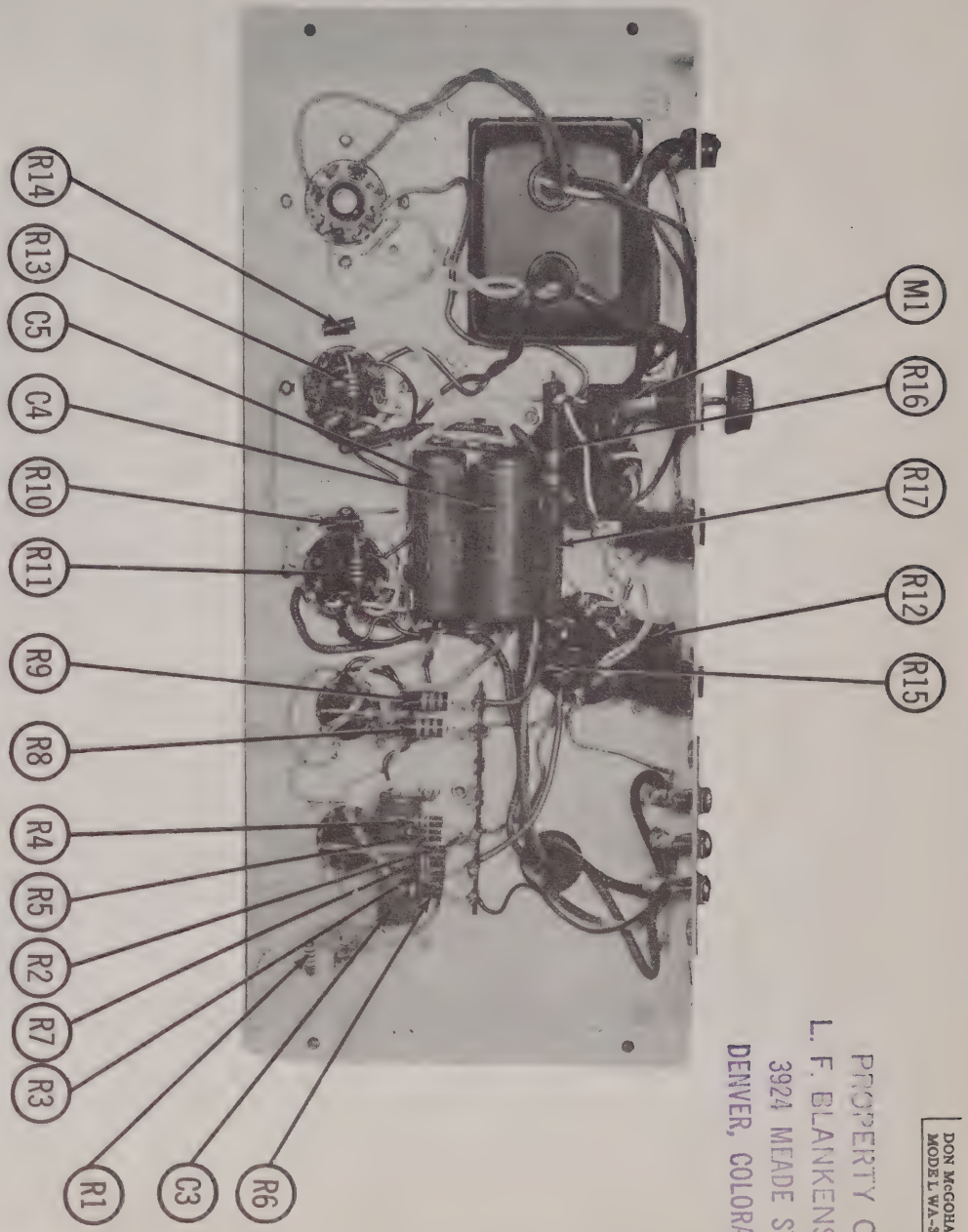
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		Don McGohan PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	6.4KΩ CT	16Ω tap @ 8Ω	320Ω CT	.6Ωtap @.45Ω					S-31A ①	① Drill new mounting holes.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Don McGohan PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	2A			312002 (3AG-2A)	342001	AGC2	HKP

CHASSIS—BOTTOM VIEW



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DON McGOHAN
MODEL WA-312

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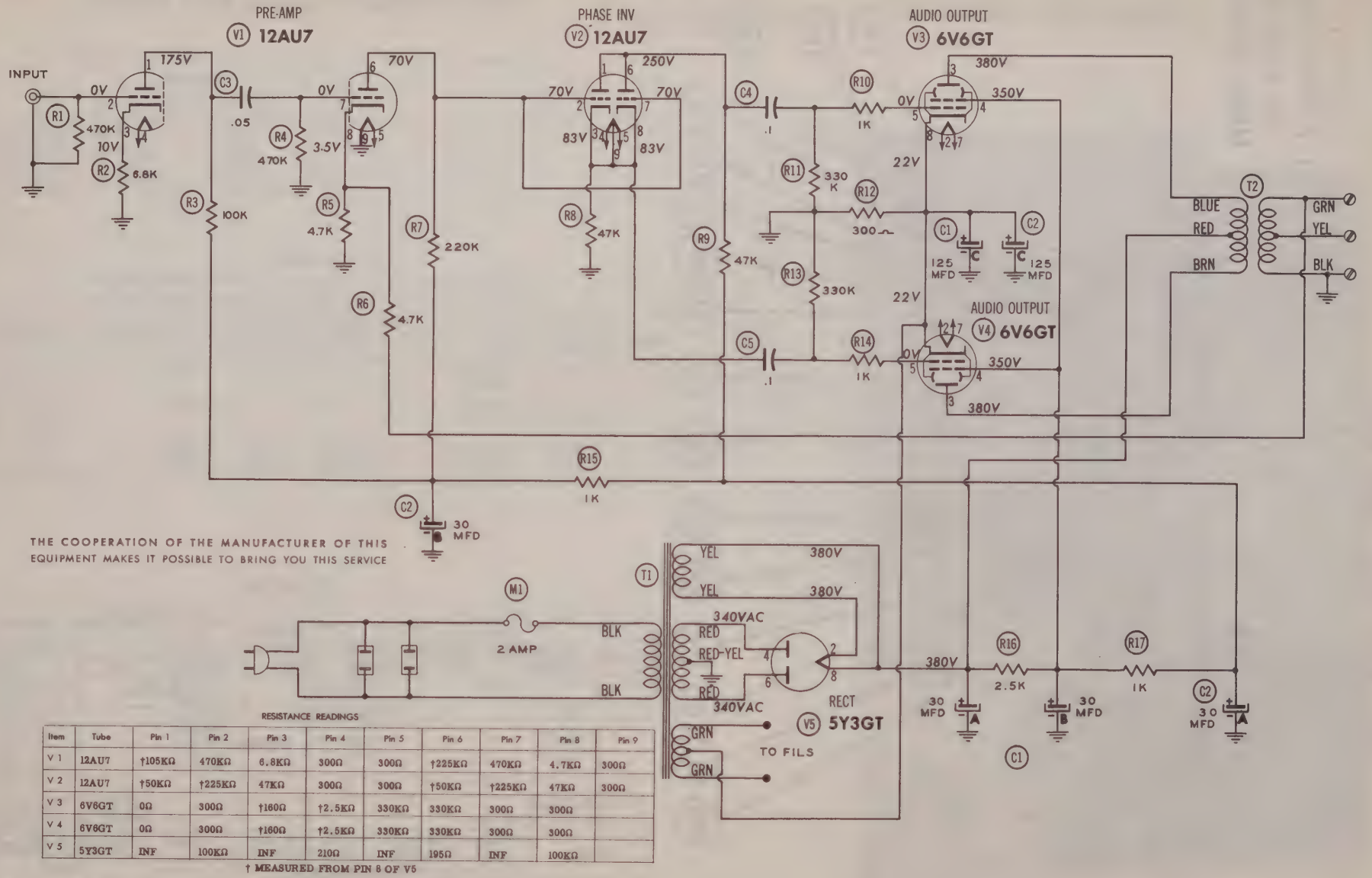
MODEL WA-312



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AU7	†105KΩ	470KΩ	6.8KΩ	300Ω	300Ω	†225KΩ	470KΩ	4.7KΩ	300Ω
V 2	12AU7	†50KΩ	†225KΩ	47KΩ	300Ω	300Ω	†50KΩ	†225KΩ	47KΩ	300Ω
V 3	6V6GT	0Ω	300Ω	†160Ω	†2.5KΩ	330KΩ	330KΩ	300Ω	300Ω	
V 4	6V6GT	0Ω	300Ω	†160Ω	†2.5KΩ	330KΩ	330KΩ	300Ω	300Ω	
V 5	5Y3GT	INF	100KΩ	INF	210Ω	INF	195Ω	INF	100KΩ	

† MEASURED FROM PIN 8 OF V5

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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227-9

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% voltage and resistance readings.
6- All controls at minimum, proper output load connected.

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MODEL 18B3001

PHILCO MODELS A-T1816, A-T1856W, A-T2230, A-T2272, A-T2275, A-UT2272, 18B3000, 18B3001, 18B3100, L, HM, 18BU3000, 18BU3001, 18BU3100, L, HM, 22B4000, 22B4100, L, 22B4101, 22B4301, 22B4303, 22BU4000, 22BU4100, L, 22BU4101, 22BU4303 (Ch. D-81, D-181, R-81A, B, R-181, R-181U) (Codes 129, 130)

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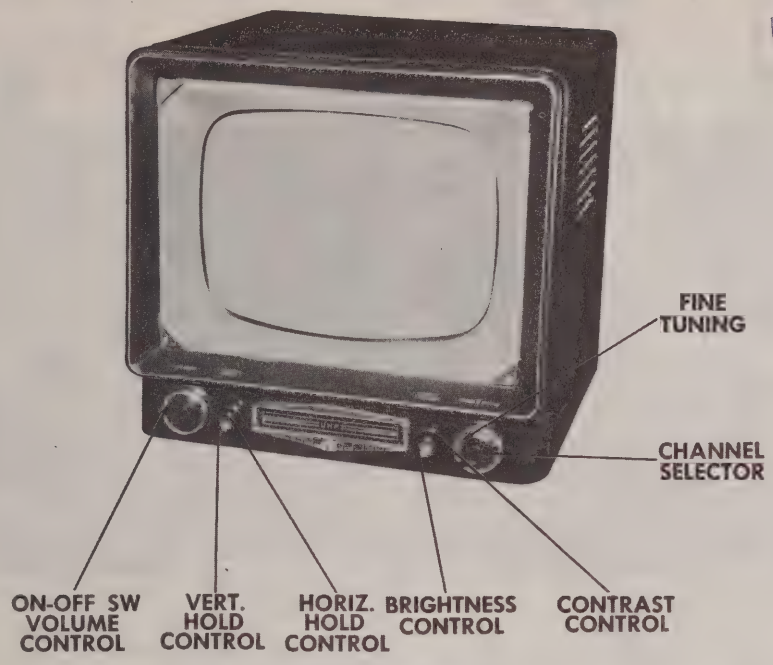

PHILCO MODEL 18B3001

TRADE NAME	PHILCO MODELS	RF CHASSIS	SWEEP CHASSIS	CODE	UHF
	A-T1816	R-81A	D-81	129	
	A-T1856W	R-81A	D-81	129	
	A-T2230	R-81A	D-81	129	
	A-T2272	R-81A	D-81	129	
	A-UT2272	R-81A	D-81	129	UT21C
	A-T2275S	R-81A	D-81	129	
	18B3000	R-181	D-181	130	
	18BU3000	R-181U	D-181	130	UT21D
	18B3001	R-181	D-181	130	
	18BU3001	R-181U	D-181	130	UT21D
	18B3100, L, HM	R-181	D-181	130	
	18BU3100, L, HM	R-181U	D-181	130	UT21D
	22B4000	R-181	D-181	130	
	22BU4000	R-181U	D-181	130	UT21D
	22B4100, L	R-181	D-181	130	
	22BU4100, L	R-181U	D-181	130	UT21D
	22B4101	R-81B	D-81	129	
	22BU4101	R-81B	D-81	129	UT21C
	22B4301	R-181	D-181	130	
	22B4303	R-181	D-181	130	
	22BU4303	R-181U	D-181	130	UT21D

MANUFACTURER: Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET: Television Receiver
TUBES: Nineteen
POWER SUPPLY: 110-120 Volts AC-60 Cycle — RATING 1.2 Amp. @ 117 Volts AC
TUNING RANGE: Channels 2 thru 13, Video IF 26.6MC, Sound IF 22.1MC (Intercarrier)

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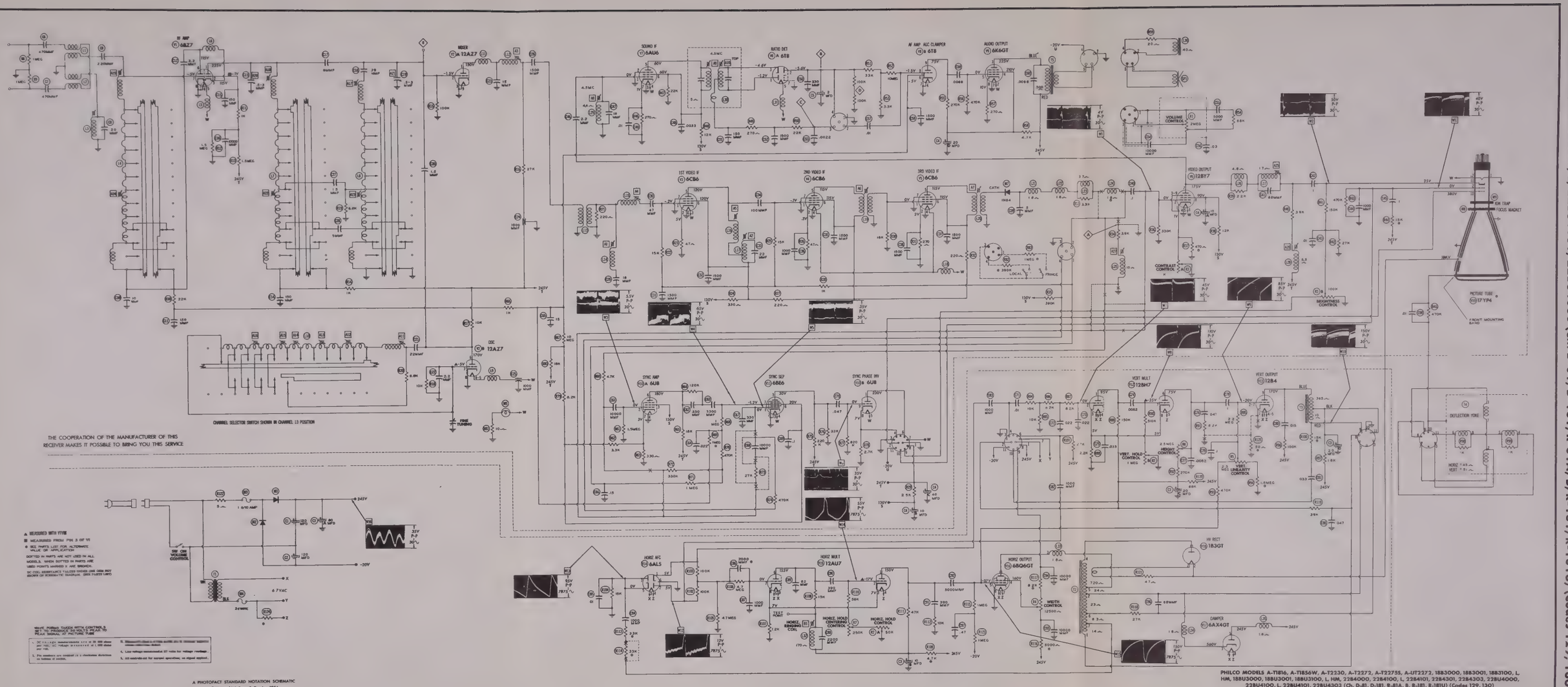
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PHILCO MODELS A-T1816, A-T1856W, A-T2230, A-T2272, A-T22755, A-UT2272, 18B3000, 18B3001, 18B3100, L, HM, 18BU3000, 18BU3001, 18BU3100, L, HM, 22B4000, 22B4100, L, 22B4101, 22B4301, 22B4303, 22BU4000, 22BU4100, L, 22BU4101, 22BU4303 (Ch. D-81, D-181, R-81A, B, R-181, R-181U) (Codes 129, 130)

PHILCO MODELS A-T1816, A-T1856W, A-T2230, A-T2272, A-T22755, A-UT2272, 18B3000, 18B3001, 18B3100, L, HM, 18BU3000, 18BU3001, 18BU3100, L, HM, 22B4000, 22B4100, L, 22B4101, 22B4301, 22B4303, 22BU4000, 22BU4100, L, 22BU4101, 22BU4303 (Ch. D-81, D-181, R-81A, B, R-181, R-181U) (Codes 129, 130)

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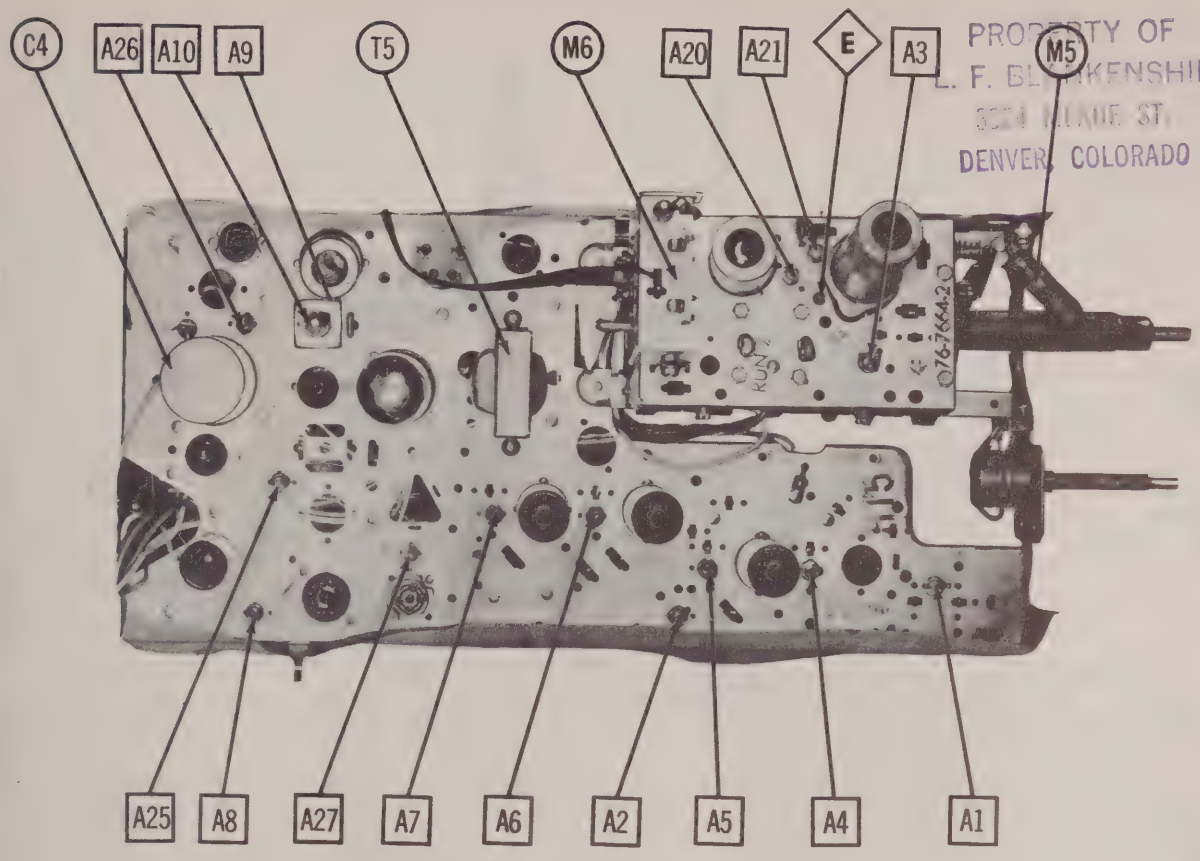
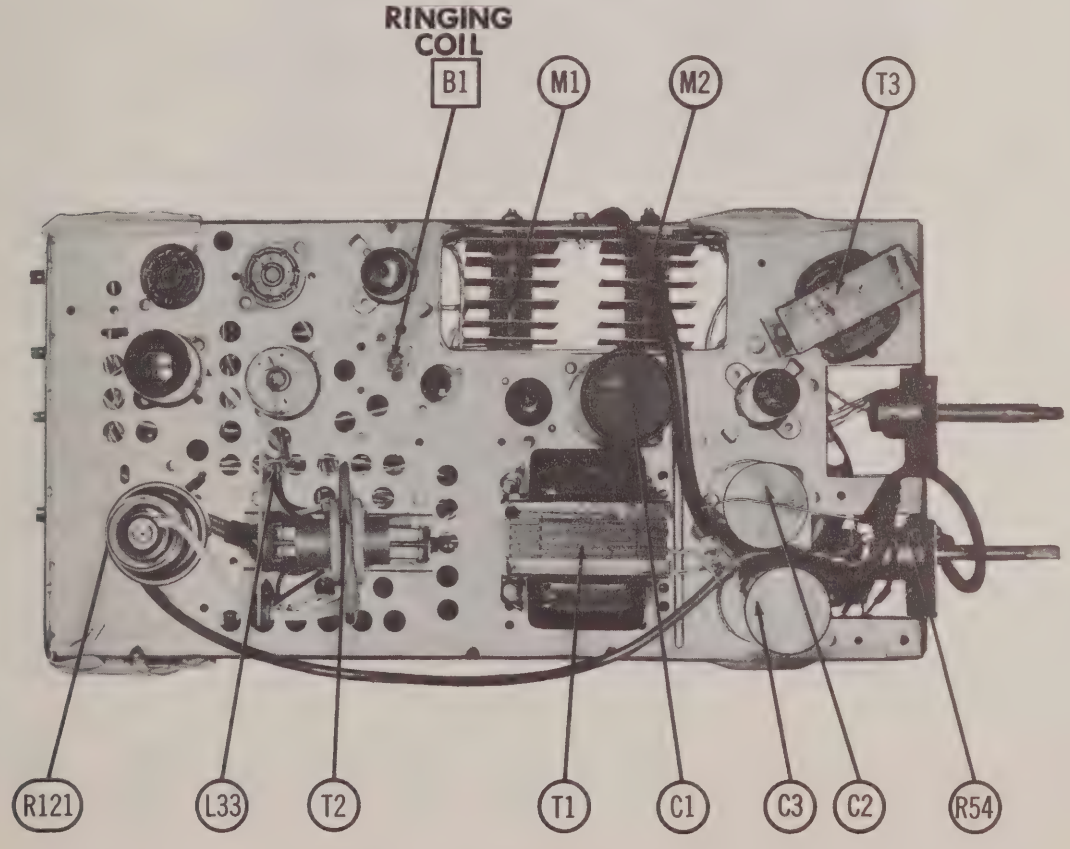
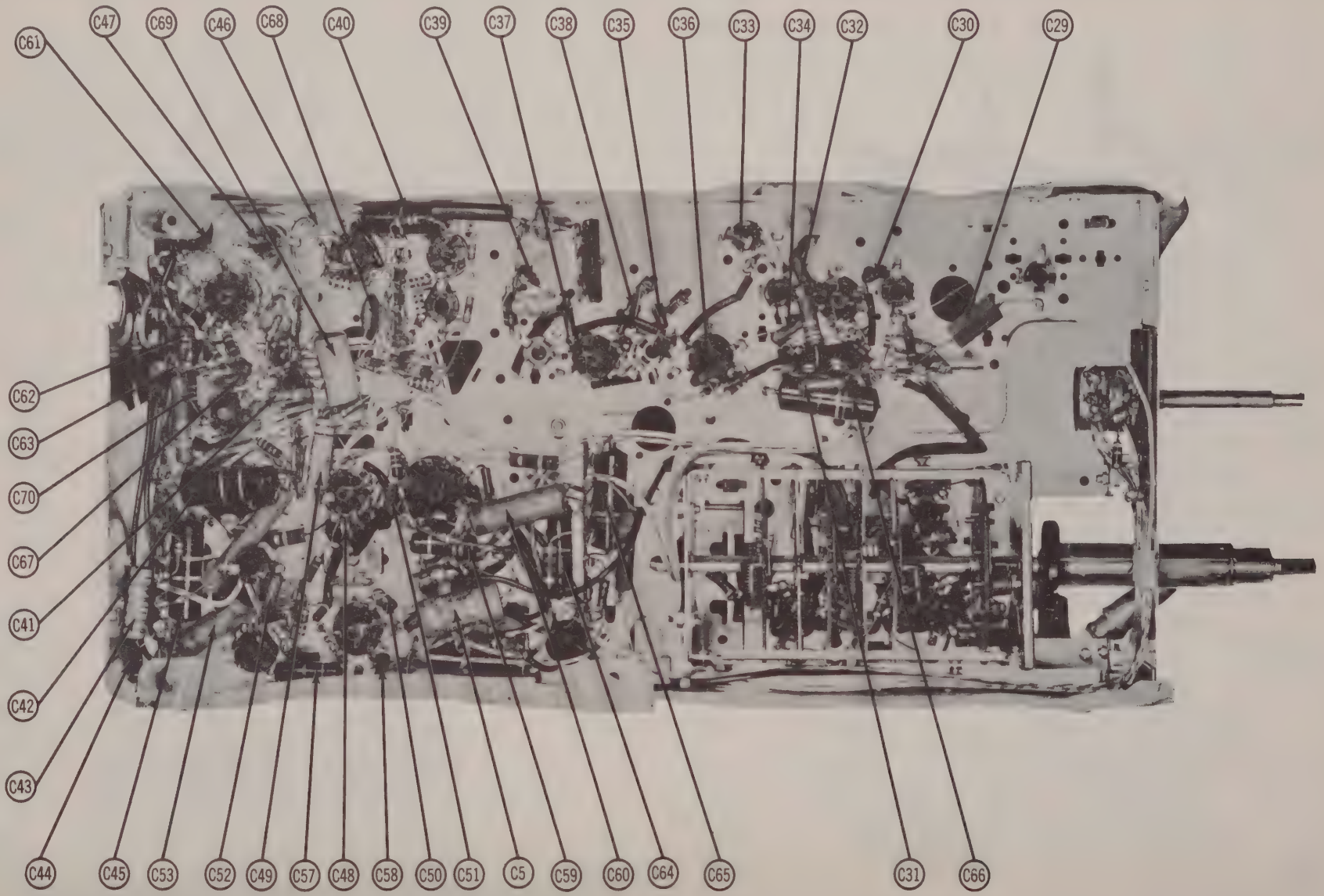


RF-IF CHASSIS-TOP VIEW



SWEEP CHASSIS-TOP VIEW



RF-IF CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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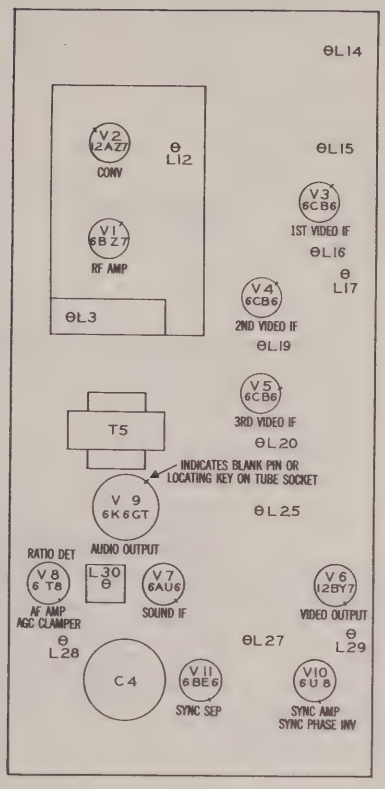

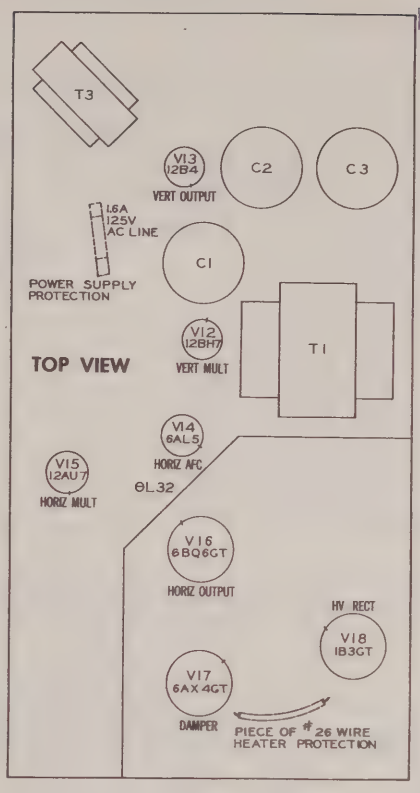

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifier (M1 & M2), Fuse (M3)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V19
Has pic, no sound - V7, V8, V9
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V10, V12, V13
No horiz. sync - V10, V14, V15
No vert. or horiz. sync - V10, V11

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V19
No vertical deflection - V12, V13
Poor vert. linearity or foldover - V12, V13
Poor horiz. linearity or foldover - V15, V16, V17
Narrow picture - V15, V16, V17, V18, M1, M2
Vert. off freq. - V10, V12, V13
Horiz. off freq. - V10, V14, V15

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator to disable the high voltage. Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Set the brightness and contrast controls at maximum counter clockwise rotation.
Connect the negative lead of a 3V bias supply to Pin 1 of the "video test" socket. Connect the positive lead to chassis.
The IF shield (under chassis) must be in place during alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	Not used	28.1MC (400~Mod)	4	Vert. Amp. thru 2200Ω to point (A). (Pin 2 of video test jack). Low side to chassis.	A1	Adjust for MINIMUM 400~ indication on scope.
2.	"	"	"	22.1MC	"	"	A2	"
3.	"	"	"	24.0MC	"	"	A3	Adjust for maximum 400~ indication on scope.
4.	"	"	"	25.7MC	"	"	A4	"
5.	"	"	"	23.6MC	"	"	A5	"
6.	"	"	"	26.4MC	"	"	A6	"
7.	"	"	"	24.5MC	"	"	A7	"
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120~ in each lead	69MC (10MC Swp)	67.25MC	"	"		Loosely couple a marker generator to the mixer grid test point on top of tuner. Set generator to 26.6MC. Adjust the fine tuning control to zero beat the two markers as observed on the scope. Remove the separate marker generator.
9.	"	"	"	67.25MC 70.25MC	"	"		Check for response curve as in Fig. 1. If necessary, retouch A3, A4, A5, A6 and A7 for desired response. A4 and A6 affects the video carrier level. A7 affects flat top response and A5 affects low frequency response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove 6CB6 (V3) from its socket.
Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	2200Ω Carbon Resistor	High side to point (A) Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe to point (B) Common to chassis.	A8, A9	Adjust for maximum deflection. Attenuate generator output to maintain not more than 10 volts at VTVM.
11.	"	"	"	"	DC probe to point (C) Common to point (D).	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6CB6 (V3) from its socket.
Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	2200Ω carbon resistors	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. amp. to point (B). Low side to chassis.	A8, A9	Disconnect stabilizer capacitor C5. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
11.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A10	Reconnect stabilizer capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. Slightly retouch A9 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Disconnect AGC (white) lead to tuner at terminal strip and connect the negative lead of a 1.5volt battery to the white lead. Connect the positive lead to chassis. If regeneration occurs, bias may be increased to 4 or 5 volts.
Couple the 26.6MC output of a second generator to the first video IF amplifier tube, V3, by removing the tube shield and attaching the output leads of the generator to the ends of a few turns of wire wrapped around the tube.
The output is set at 26.6MC throughout the entire oscillator alignment.
Preset the fine tuning for all adjustments by placing the stop on the fine tuning cam between the channel 7 and 8 holes on the tuner front plate.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the ocilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-postion of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	Not used	211.25MC 199.25MC 187.25MC	13 11 9	Vert. amp thru 15KΩ to point (A). Low side to chassis.	A11 A12 A13	Adjust for zero beat with 26.6MC IF signal as indicated on scope.
13.	Repeat step 12 until channels 13, 11, and 9 are within 500KC of their correct frequencies.							
14.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	Not used	175.25MC 83.25MC 67.25MC	7 6 4	Vert. amp thru 15KΩ to point (A). Low side to chassis.	A14 A15 A16	Adjust for zero beat with 26.6MC IF signal as indicated on scope.

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ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT

Leave bias connected as under oscillator alignment.
Disconnect the tuner coupling link at the IF terminal strip (near V3) and solder a 68Ω carbon resistor to the open end of the link.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	213MC	13	Vert. Amp. thru 100KΩ to point (E). Low side to chassis.	A17, A18 A19	Adjust A17 and A18 for a symmetrical approximately centered bandpass. Detune A18 counter clockwise until a single peak appears. Adjust A17 until peak falls at 213MC. Adjust A19 for maximum curve height and symmetry of peak. Readjust A27 and A28 for symmetrical response as in Fig. 4.
16.	"	"	177MC (10MC Swp)	177MC	7	"	A20, A21	Check for response as indicated by dotted line curves in Figs. 5A and 5B. If response is not symmetrical and centered about 177 MC, adjust A20 and A21 for mirror image of original response curve. This adjustment over compensates to allow for the effect of channel 13 adjustment on channel 7. Repeat adjustment A20 and A21 until centered and symmetrical response curves are obtained on channels 13 and 7.
17.	"	"	85MC (10MC Swp)	85MC	6	"	A22, A23, A24	Adjust A22 and A23 for a symmetrical approximately centered band pass. Detune A23 counter clockwise until a single peak appears. Adjust A22 until peak falls at 85MC. Adjust A24 for maximum curve height and symmetry. Readjust A22 and A23 for symmetrical response as in Fig. 4. Remove 68Ω resistor and reconnect coupling link to 1st IF.

4.5MC TRAP ALIGNMENT

Turn the set on and tune in a TV test pattern.
Adjust A25 for maximum vertical wedge definition.

VIDEO PEAKING COIL ADJUSTMENT

In case of excessive overshoot or smear on some stations it may be necessary to adjust A26 and A27. Alignment of the tuner and IF portions of the receiver must be correct before this adjustment is made. Counter clockwise adjustment reduces picture smear and increases trailing whites and clockwise adjustment reduces trailing whites and overshoot. Proper adjustment point is the point of minimum smear and trailing whites.

UHF TUNER ADAPTER ALIGNMENT

The UHF tuner adapter has been properly aligned at the factory. If the unit requires major repair or alignment it should be returned to the factory.
Replacing the tube may detune the tuner. If this occurs try several tubes until a satisfactory substitute is found.

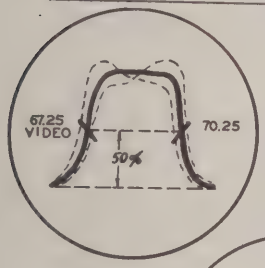


FIG 1

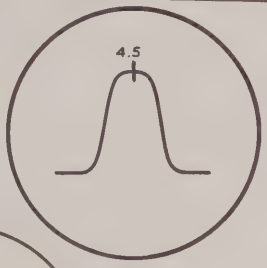


FIG.2

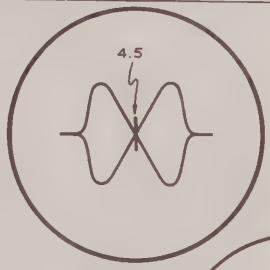


FIG.3

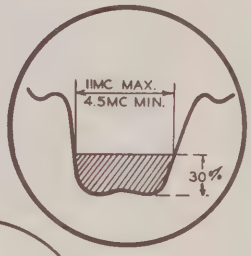


FIG. 4

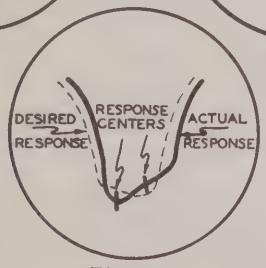


FIG 5A

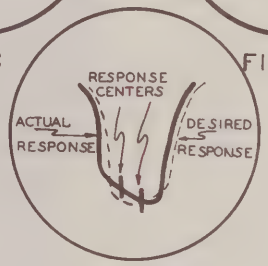


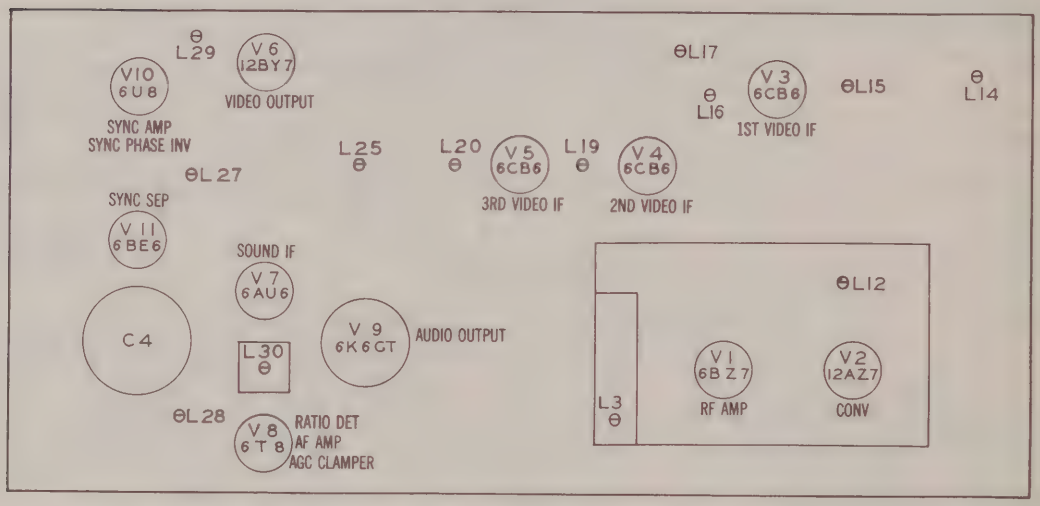
FIG 5B

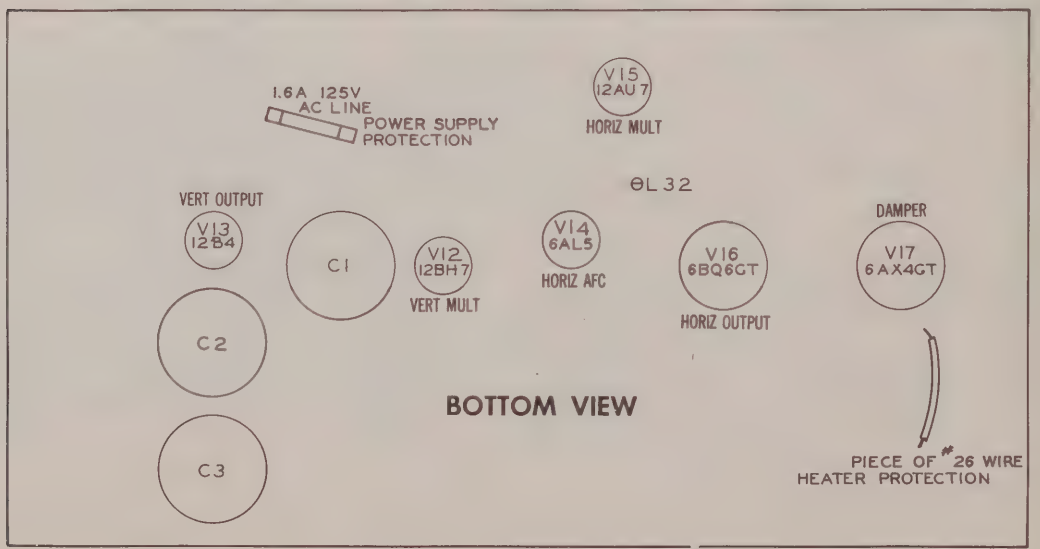
PHILCO MODELS A-T1816, A-T1856W, A-T2230, A-T2272, A-T2275, A-UT2272, 18B3000, 18B3001, 18B3100, L, HM, 18BU3000, 18BU3001, 18BU3100, L, HM, 22B4000, 22B4100, L, 22B4101, 22B4301, 22B4303, 22BU4000, 22BU4100, L, 22BU4101, 22BU4303 (Ch. D-81, D-181, R-81A, B, R-181, R-181U) (Codes 129, 130)

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	†1KΩ	1.5Meg	INF	0Ω	.1Ω	INF	2Meg	0Ω	0Ω
V 2	12AZ7	†27KΩ	100KΩ	0Ω	.1Ω	.1Ω	†10KΩ	10KΩ	0Ω	0Ω
V 3	6CB6	1.5Meg	47Ω	.1Ω	0Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 4	6CB6	1.5Meg	47Ω	.1Ω	0Ω	†3KΩ	†3KΩ	0Ω		
V 5	6CB6	.4Ω	270Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 6	12BY7	400Ω	330KΩ	†0Ω	0Ω	0Ω	.1Ω	†3.9KΩ	†14.5KΩ	400Ω
V 7	6AU6	4.4Ω	0Ω	0Ω	.1Ω	†14.5KΩ	†14.5KΩ	270Ω		
V 8	6T8	INF	36KΩ	INF	0Ω	.1Ω	1.5Meg	0Ω	10Meg	†275KΩ
V 9	6K6GT	10Ω	.1Ω	†500Ω	†4.7KΩ	470KΩ	†0Ω	0Ω	270Ω	
V 10	6U8	†2.7KΩ	1.5Meg	†2.5KΩ	0Ω	.1Ω	†18KΩ	330Ω	2.7KΩ	820KΩ
V 11	6BE6	†860KΩ	0Ω	0Ω	.1Ω	†220KΩ	†26KΩ	1.8Meg		
V 12	12BH7	¶190KΩ	26.5KΩ	2.2KΩ	.1Ω	.1Ω	¶1.8Meg	780KΩ	2.2KΩ	0Ω
V 13	12B4	0Ω	4.5Meg	0Ω	.1Ω	.1Ω	INF	4.5Meg	INF	†2.1KΩ
V 14	6AL5	4.8Meg	4.8Meg	0Ω	.1Ω	15KΩ	INF	15KΩ		
V 15	12AU7	†52KΩ	140KΩ	1.2KΩ	.1Ω	.1Ω	†20KΩ	9.4Meg	1.2KΩ	0Ω
V 16	6BQ6GT	1.6Meg	0Ω	INF	†5.5KΩ	1.5Meg	900KΩ	.1Ω	0Ω	TOP CAP ¶25Ω
V 17	6AX4GT	¶18Ω	INF	100KΩ	INF	†1.8Ω	.1Ω	0Ω	.1Ω	
V 18	1B3GT		PINS	1 - 8	HAVE	INF RESISTANCE				TOP CAP ¶745Ω
V 19	17YP4	0Ω	470KΩ	PIN 10 ¶39KΩ	PIN 11 †150KΩ	PIN 12 .1Ω				

¶ MEASURED FROM PIN 3 OF V17
† MEASURED FROM OUTPUT OF M1

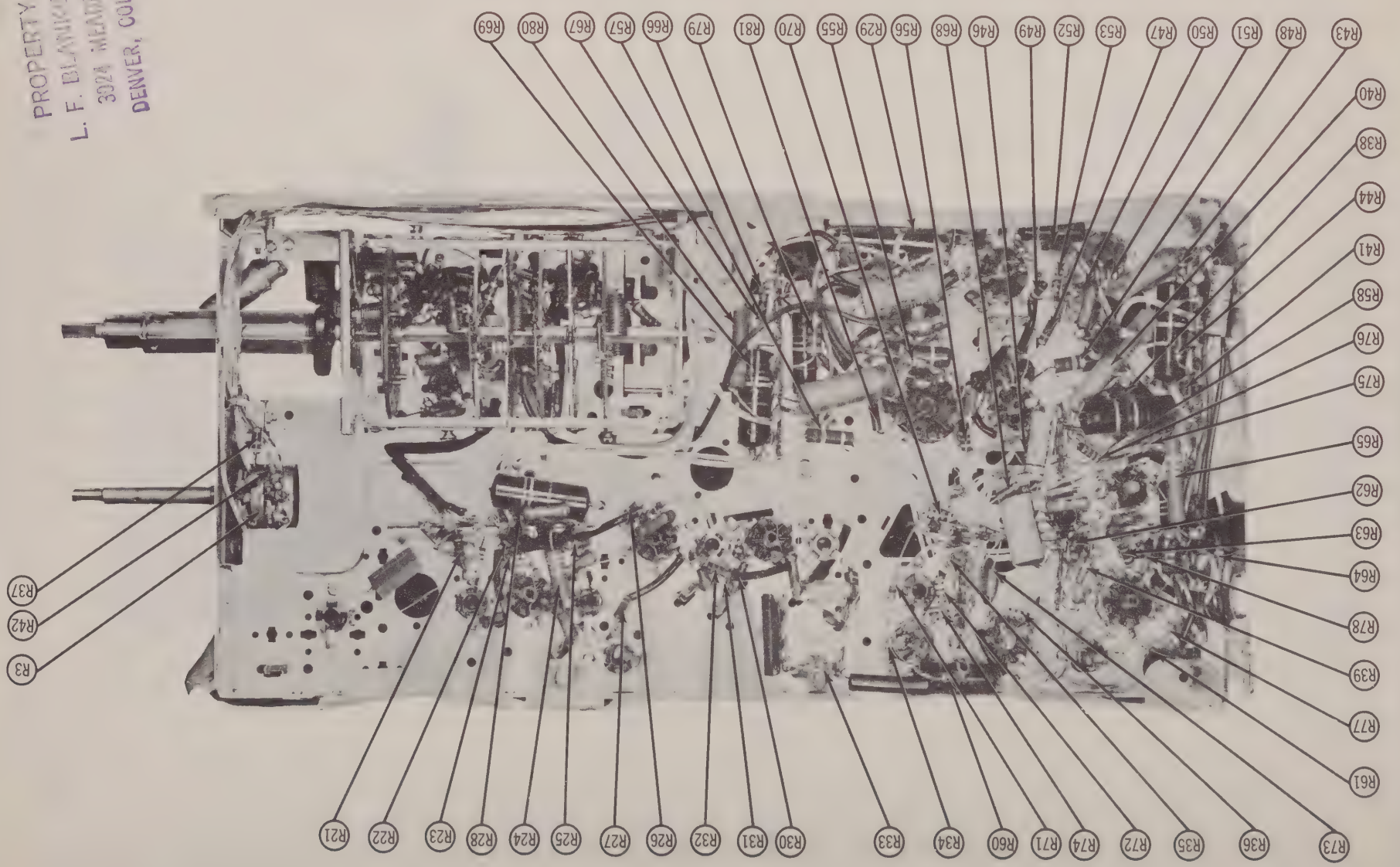


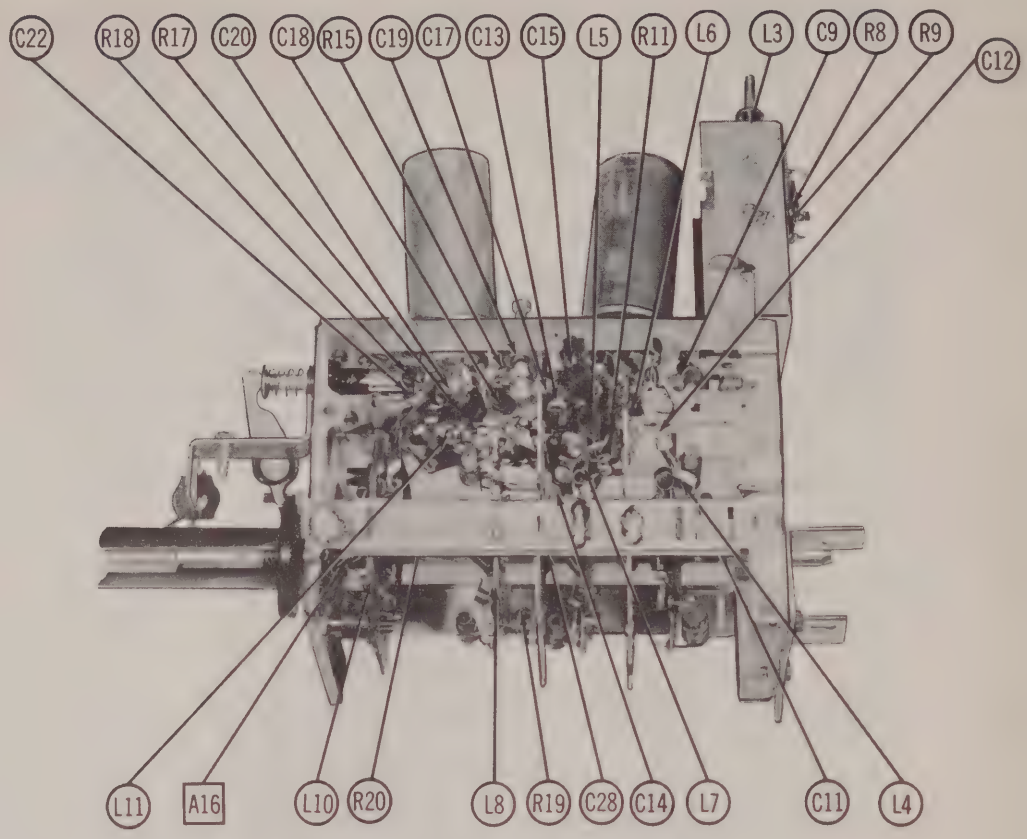


TUBE PLACEMENT CHART

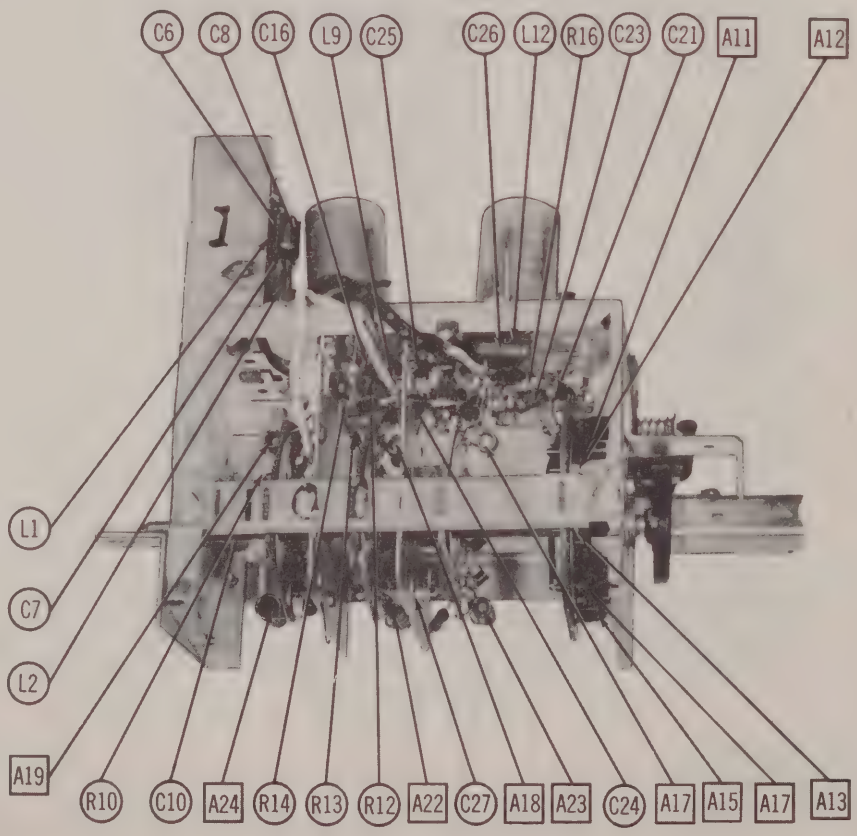
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

RF-IF CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION



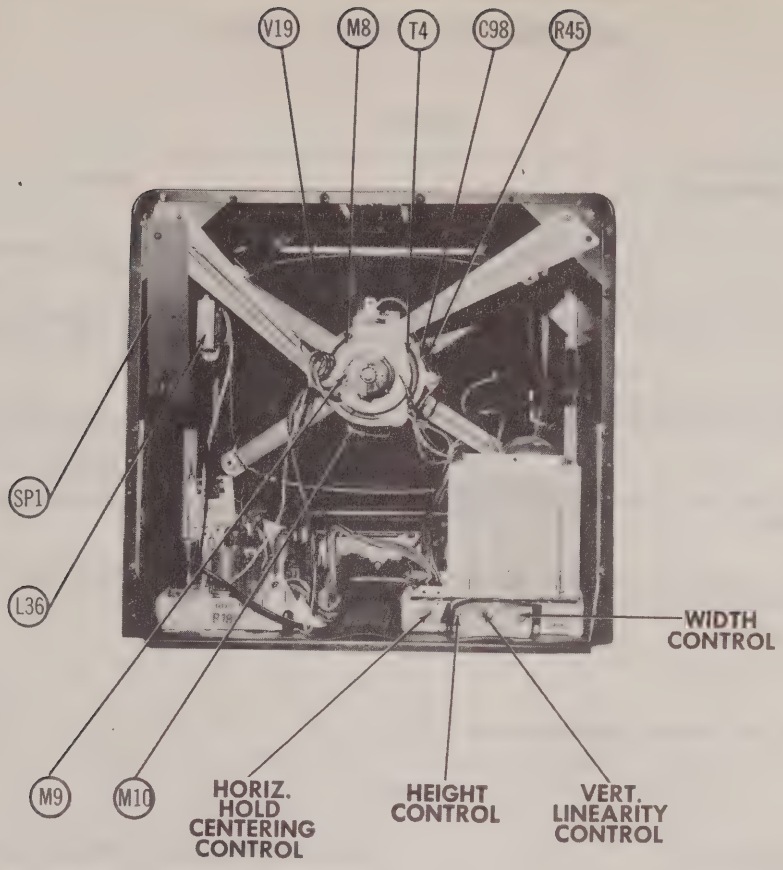


RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

PROPERTY OF
L. F. BLANKENSHIP
3524 MEADE ST
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station preferably a test pattern.

Reduce the picture width until approximately one inch of blank screen appears on each side of the picture.

Increase the brightness control setting until the blanking time becomes visible as indicated by a dark bar at each side of the picture.

Connect a .1MFD capacitor from the test point at junction of R108 and L32, to chassis.

Set the horizontal hold control at the center of its range.

Adjust the horizontal hold centering control until the picture is centered between the two blanking bars.

Remove the .1MFD capacitor.

Adjust the horizontal ringing coil slug (B1) until the picture is again centered between the two blanking bars.

Rotate the horizontal hold control through its range.

Check the number of diagonal bars on either side of the pull-in range of the horizontal hold.

There should be 1 or 2 bars present.

If proper pull-in is not obtained, repeat the above procedure.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V15, V16 and V17. Check adjustment of the width control. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check T2, T4A, C93, C95, width control and other associated circuit components.	Check C90, C91, C92, R108, R111 and other associated components.

DRIVE LINES

Check by substitution V15, V16 and V17. Check T2, T4A, C91, C92, C95 and other associated circuit components.

COMPRESSED LEFT SIDE

Check by substitution V16 and V17. Check T2, T4A, C95, C93 and other components associated with the horizontal output and damper stages.

FOLDS

Follow procedure outlined under "Drive Lines".

XMAS TREE EFFECT

Substitute V15. Check C88, C89, C90, L32 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V12 and V13. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check R97, T3, T4B and other associated circuit components.	Check C76, C77, C78, C79, R92, R95, and other associated components.

INSUFFICIENT SWEEP

Check by substitution V12 and V13. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM EXPANDED TOP

Check by substitution V12 and V13. Check C78 and C76 for leakage.

FOLDS

Substitute V12 and V13. Check C78 for leakage. Check R95 for change of value. Check T3 and other associated components.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Check by substitution V10 and V11. Check associated circuit components especially C63, C70, C61, R65 and R75.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Check by substiution V10, V11 and V12. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check components associated with V12 especially C74 and C75.	Check components associated with V11 and V12 especially the integrator network.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V14 and V15. Check associated circuit components.

HORIZONTAL BENDING

Check by substitution V14, V15 and V16. Check C87 for leakage. Check AFC network for component failure or change of value.

VIDEO

LOSS OF VIDEO

Check C42, R41, picture tube and associated components.

SOUND BARS (4.5MC BEAT)

Check local oscillator adjustment. Check adjustment of 4.5MC trap (A25). Check video IF alignment.

NEGATIVE PIX

Substitute V6. Check video detector crystal and assembly. Check AGC network for component failure. Check picture tube and associated components.

POOR CONTRAST

Substitute V6. Check video detector crystal and assembly. Check picture tube and associated components.

SMEAR

Substitute V6. Check video detector assembly. Check C40, C42, R36, R38, R40, R41, L26, L28, picture tube and other associated circuit components for change of value or failure.

WIDE BLACK BAR ACROSS PIX

Check V1, V2, V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8 and V9. Check stages of V8B and V9 using an audio signal generator. Apply signal across R52.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V8B and V9 especially C59, and R58.

BUZZ

Adjust ratio detector secondary (A10) for minimum buzz. If buzz is still objectionable, substitute V8 and realign audio (A8, A9, and A10), follow procedure outlined in the alignment section.

DISTORTED

Check by substitution V8, V9 and V7. Follow procedure outlined under "Weak or No Sound".

PHILCO MODELS A-T1816, A-T1856W, A-T2230, A-T2272, A-T2275, A-UT2272, 18B3000, 18B3001, 18B3100, L, HM, 18BU3000, 18BU3001, 18BU3100, L, HM, 22B4000, 22B4100, L, 22B4101, 22B4301, 22B4303, 22BU4000, 22BU4100, L, 22BU4101, 22BU4303 (Ch. D-81, D-181, R-81A, B, R-181, R-181U) (Codes 129, 130)

PROPERTY OF
L. F. BLANKENSHIP
3072 MEADE
DENVER, COLORADO

UHF TUNER SCHEMATIC

UHF RF AMP
6BQ7
UHF OSC
6AF4
UHF TUNER UT21D
TO VHF ANT
TO TV RECEIVER ANT. TERMINALS
ADAPTER FOR AUDIO OUTPUT TUBE SOCKET ON TV RECEIVER
CHANGEOVER SW SHOWN IN UHF POSITION
TEST POINT
OSC TEST POINT
CATH
CHANGEOVER SW WIRING FOR COMMON (VHF) ANTENNA OPERATION. FOR SEPARATE UHF & VHF ANTENNA OPERATION, DISCONNECT LEADS H-M FROM LEADS H-H AND CONNECT TO UHF ANTENNA, LEAVING LEADS H-H DISCONNECTED.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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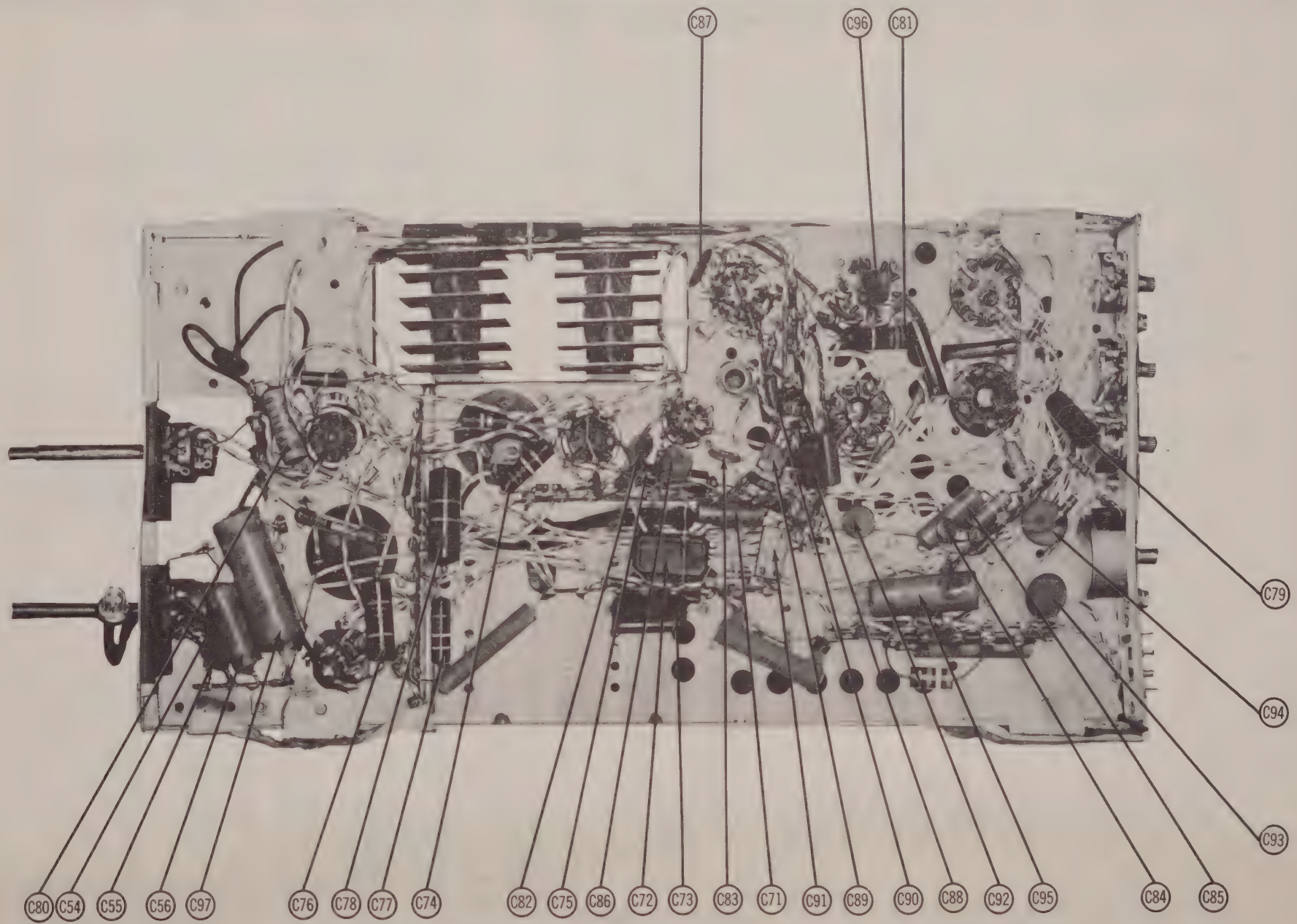


SWEEP CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	12AZ7	12AZ7	9A	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	12BY7	12BY7	9BF	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector-AF Amplifier - AGC Clamper	6T8	6T8	9E	
V9	Audio Output	6K6GT	6K6GT	7S	
V10	Sync Amplifier-Sync Phase Inv.	6U8	6U8	9AE	
V11	Sync Separator	6BE6	6BE6	7CH	
V12	Vert. Mult.	12BH7	12BH7	9A	
V13	Vert. Output	12B4	12B4	9AG	
V14	Horiz. AFC	6AL5	6AL5	6BT	
V15	Horiz. Mult.	12AU7	12AU7	9A	
V16	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6AX4GT	6AX4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: PHILCO PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V19A	17YP4	17YP4	17YP4	12D	
			17VP4 / 17LP4	12D	
B	21ZP4	21ZP4		12D	
C	21ZP4A	21ZP4A		12D	
D	21EP4A	21EP4A	21EP4A	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	120	150	30-2568-51	AFHS1-69		XA007		FP140	TVL-1540	
C2	120	150	30-2568-51	AFHS1-69		XA007		FP140	TVL-1540	
C3A	■80	300	30-2584-35	AFH4-95		DU14		FP333.8		
B	10	300		PRS450/80				TC83	TVL-4801	
C	▲20	475								
D	▲20	300								
C4A	10	300	30-2570-57	AFH4-18		DU11		FP343.6	TVL-4578	
B	▲10	300						TC62		
C	▲40	300								
D	■20	300								
C5	2	50	30-2417-7	E26E6		BBR-2-50T		TC302	TVA-1301	
C6	470		30-1225-18	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C7	470		30-1225-18	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C8	20		62-020309011	SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C9	220		62-122001001	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C10	10		62-010409011							
C11	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C12	2.2		30-1221-6	SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C13	.5-3		31-6520-3		829-3			CT565A		
C14	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C15	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C16	10000		30-1238-2	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C17	.6		30-1221-15							
C18	39		62-039409011							
C19	.5-3		31-6520-3		829-3			CT565A		
C20	1.5		30-1221-8	SI1.5NP0	TCZ-1.5		NP0K-1R5		5TCCB-V15	
C21	22		62-022009001							
C22	2.2		30-1224-66							
C23	15		62-015409011	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C24	1000		30-1245-1	EF-001	MFT-1000				503C-D1	
C25	1000		30-1245-1	EF-001	MFT-1000				503C-D1	
C26	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C27	1.5		30-1221-8	SI1.5NP0	TCZ-1.5		NP0K-1R5		5TCCB-V15	
C28	5		30-1221-13	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C29	18	500	62-018400021							
C30	47		60-00475420	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C31	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C32	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C33	22		62-022009001							
C34	100		62-110409001	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C35	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C36	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C37	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C38	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C39	5		30-1224-28	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C40	.1	200		P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C41	68		62-068409011							
C42	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C43	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C44	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C45	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C46	2.2		30-1221-6	SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C47	18		62-018400021							
C48	.0033	400		P688 - 0033	D6-332	PTE6D33	GP2-333-332	PT6233	5HK-D33	
C49	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C50	330		62-133001001	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C51	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C52	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C53	.0022	400		P688-0022	D6-222	PTE6D22	GP2-333-202	PT6222	6TM-D22	
C54	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C55	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	

PARTS LIST AND DESCRIPTIONS (Continued)

PROPERTY OF
L. F. BLANKENSHIP
3934 MEADE ST.
DENVER, COLORADO

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C56	.03	400		P488-03		PTE6S3		PT413	6TM-S3	
C57	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C58	1500			S1500	D6-152	TME4D15	GP2L-152	UC-5215	5HK-D15	
C59	.0068	400		P488-0068	D6-682	PTE6D68	GP2-333-682		6TM-D68	
C60	.0068	1000	30-4650-91	P1069-0068		PTK16D68			MH-D68	
C61	10000			BPD-01	DD-103	TM6S1	811-01	DC-511	5HK-S1	
C62	330		62-153001001	S1330	D6-331		GP2K-331	UC-5333	5CA-T33	
C63	3300	500								
C64	.033	200		P488-033		PTE4S22		PT4122	4TM-S22	
C65	.15	200		P288-15		PTE4P15		PT4015	2TM-P15	
C66	.15	200		P288-15		PTE4P15		PT4015	2TM-P15	
C67	330			S330	D6-331		GP2K-331	UC-5333	5CA-T33	
C68	10000			BPD-01	DD-103	TM6S1	811-01	DC-511	5HK-S1	
C69	.1	200		P288-1	DF-104	PT2P1		PT401	2TM-P1	
C70	.047	200		P288-047	DF-503	PTE4S47		PT4147	4TM-S47	
C71	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C72	.022	200		P488-022		PTE4S22		PT4122	4TM-S22	
C73	.022	200		P488-022		PTE4S22		PT4122	4TM-S22	
C74	.0082	400								
C75	.033	200		P488-033				PT4133		
C76	.047	400		P488-047		PTE4S47		PT4147	4TM-S47	
C77	.0082	400								
C78	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C79	.1	200		P288-1	DF-104	PT2P1		PT401	2TM-P1	
C80	.015	400		P488-015		PTE4S15			4TM-S15	
C81	.033	400		P488-033				PT4133		
C82	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C83	1000			BPD-005	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C84	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C85	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C86	2000			P588-002	DD-202	TM5D2	801-002	DC-532	5HK-D2	
C87	10000			BPD-01	DD-103	TM6S1	811-01	DC-511	5HK-S1	
C88	3300	500								
C89	68	500	60-00823317			5R5T4		MCB343	MB-34	
C90	390	500	60-10395417	1469-0004		5R6T4		MCB243	MB-24	
C91	390	500	60-10395417	1469-0004		5R6T4		MCB243	MB-24	
C92	5000			BPD-005	MD-502	TMD5	811-005	DC-525	5HK-D5	
C93	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C94	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C95	.047	600		P588-047	DF-503	PTE6S47		PT6147	6TM-S47	
C96	68	2000	30-1246-1	HVD30-000068				MCL468	20GA-Q68	
C97	.47	200		P289-47		P2P5		PT4047	2TM-P47	
C98	.01	600		P588-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	

Note 1. Some Models use .001MFD in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	33-5564-14	Q18-132X	AT-116	BT-52-S	UT-451	Volume-tapped ④ 1Meg
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SW-A	Not Req.	US-26	Attach to R1A
R2A	50KΩ	½	33-5563-62	AQ-500 *	RTV-434		UF54L) †	Horiz. Hold (Panel)
B	1Meg	½	Not Req.				UR16L)	Vert. Hold (Rear)
R3A	1000Ω	½	33-5563-63	QJ-501 *	RTV-435		UF15S) ††	Contrast (Panel)
B	100KΩ	½	Not Req.				UR15L)	Brightness (Rear)
R4A	12, 500Ω	2	33-5546-51	WK-12500	A42-1500		R15000L	Width - wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4		Not Req.	Attach to R4A
R5A	2.5Meg	½	33-5565-32	Q11-239	AG-84-S	AB-83	SU-565	Vert. Linearity
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	2.5Meg	½	33-5565-32	Q11-239	AG-84-S	AB-83	SU-565	Height
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	250KΩ	½	33-5565-17	Q11-130	AG-55-S	AB-80	SU-46	Horiz. Hold Centering
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R7A

† Universal replacement (Mallory exact duplicate part #UK1014)
†† Universal replacement (Mallory exact duplicate part #UK27)
* CONCENTRIKIT EQUIVALENT - KIT K-2 BASE ELEMENTS & SHAFTS B1T-106 & P1-300 (Panel)
B1J-123 & R1-216 (Rear)
♦ CONCENTRIKIT EQUIVALENT - KIT K-2 BASE ELEMENTS & SHAFTS B1J-123 & P1-200 (Panel)
B1J-137 & R1-216 (Rear)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	NOTES
R8	1Meg	½		BTS-1Meg	
R9	1Meg	½		BTS-1Meg	
R10	22KΩ	½		BTS-22K	Note 1.
R11	1000Ω	½		BTS-1000	
R12	1.5Meg 5%	½			
R13	1.5Meg 5%	½			
R14	1000Ω	½		BTS-1000	
R15	100KΩ	½		BTS-100K	
R16	27KΩ	1	66-3274340	BTA-27K	
R17	10KΩ	1	66-3104340	BTA-10K	Note 2.
R18	10KΩ	½		BTS-10K	
R19	6800Ω	½		BTS-6800	
R20	6800Ω	½		BTS-6800	
R21	220Ω	½		BTS-220	
R22	15KΩ	½		BTS-15K	
R23	47Ω	½		BTS-47	
R24	330Ω	1	66-1334340	BTA-330	
R25	15KΩ	½		BTS-15K	
R26	47Ω	½		BTS-47	
R27	220Ω	½		BTS-220	
R28	1000Ω	½		BTS-1000	
R29	2500Ω	6.2	33-3446-5		
R30	18KΩ	½		BTS-18K	
R31	270Ω	½		BTS-270	
R32	330Ω	½		BTS-330	
R33	3300Ω	½		BTS-3300	
R34	3900Ω	½		BTS-3900	
R35	390KΩ	½		BTS-390K	
R36	330KΩ	½		BTS-330K	
R37	470Ω	½		BTS-470	
R38	12KΩ	½		BTS-12K	
R39	2200Ω	½		BTS-2200	
R40	3900Ω	7	33-1335-116		
R41	150KΩ	½		BTS-150K	
R42	27KΩ	½		BTS-27K	
R43	470KΩ	½		BTS-470K	
R44	15KΩ	½		BTS-15K	
R45	470KΩ	1		BTA-470K	
R46	270Ω	½		BTS-270	
R47	22KΩ	½		BTS-22K	
R48	12KΩ	1	66-3124340	BTA-12K	
R49	270Ω	½		BTS-270	
R50	22KΩ	½		BTS-22K	
R51	33KΩ	½		BTS-33K	
R52	10Meg	½		BTS-10Meg	
R53	3300Ω	½		BTS-3300	
R54	68KΩ	½		BTS-68K	
R55	270KΩ	½		BTS-270K	
R56	470KΩ	½		BTS-470K	
R57	270Ω	1	66-1274340	BTA-270	
R58	4700Ω	½	66-2474340	BTS-4700	
R59	20Ω				
R60	4700Ω	½		BTS-4700	
R61	1.5Meg	½		BTS-1.5Meg	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	NOTES
R62	3300Ω	½		BTS-3300	
R63	330Ω	½		BTS-330	
R64	120KΩ	½		BTS-120K	
R65	18KΩ	2	66-3185340	BTS-18K	
R66	1000Ω	½		BTS-1000	
R67	10Meg 5%	½	66-6108240	BTS-10Meg 5%	
R68	1Meg 5%	½	66-5108240	BTS-1Meg 5%	
R69	1 Meg	½		BTS-1Meg	Note 3.
R70	470KΩ	½		BTS-470K	
R71	1Meg	½		BTS-1Meg	
R72	330KΩ	½		BTS-330K	
R73	27KΩ	½		BTS-27K	
R74	470KΩ	½		BTS-470K	
R75	220KΩ	½		BTS-220K	
R76	33KΩ	½		BTS-33K	
R77	820KΩ	½		BTS-820K	
R78	2700Ω	½		BTS-2700	
R79	8200Ω	1	66-2824340	BTA-8200	
R80	18KΩ	2	66-3185340	BTS-18K	
R81	10Ω	½		BTS-10	
R82	390KΩ	½		BTS-390K	Note 4.
R83	1Meg	½		BTS-1Meg	Note 4.
R84	10KΩ	½		BTS-10K	
R85	10KΩ	½		BTS-10K	
R86	8200Ω	½		BTS-8200	
R87	8200Ω	½		BTS-8200	
R88	2200Ω 5%	½	66-2328240	BTS-2200 5%	
R89	150KΩ	1	66-4154340	BTA-150K	
R90	510KΩ 5%	½	66-4518240	BTS-510K 5%	
R91	8200Ω	½		BTS-8200	
R92	270KΩ	½		BTS-270K	
R93	470KΩ	½		BTS-470K	
R94	1.8Meg	½		BTS-1.8Meg	Note 7.
R95	2.2Meg	½		BTS-2.2Meg	
R96	100KΩ	1	66-4104340	BTA-100K	
R97	1800Ω	5	33-1335-102		
R98	1000Ω	½		BTS-1000	
R99	1000Ω	½		BTS-1000	
R100	15KΩ	½		BTS-15K	Note 5.
R101	2700Ω	½		BTS-2700	
R102	100KΩ	½		BTS-100K	
R103	100KΩ	½		BTS-100K	
R104	15KΩ	½		BTS-15K	
R105	4.7Meg	½		BTS-4.7Meg	
R106	4.7Meg	½		BTS-4.7Meg	
R107	1200Ω	½		BTS-1200	
R108	15KΩ	½		BTS-15K	
R109	4700Ω	½		BTS-4700	Note 2.
R110	56KΩ	½		BTS-56K	
R111	47KΩ	½		BTS-47K	
R112	10KΩ	½		BTS-10K	
R113	33KΩ	1	66-334340	BTA-33K	Note 8.
R114	33KΩ	1		BTA-33K	Note 4.
R115	1Meg	½		BTS-1Meg	
R116	5000Ω	5	33-1335-118	1 3/4A-5000	Note 9.
R117	8200Ω	½		BTS-8200	Note 6.
R118	27KΩ	½		BTS-27K	
R119	39KΩ	2	66-3395340	BTS-39K	
R120	68KΩ	½		BTS-68K	
R121	4.7Ω	1	66-9478340		
R122	5Ω	10	33-3448-5	1 3/4A-5	
R123	1Meg	½		BTS-1Meg	
R124	*	*			
R125	150Ω	½		BTS-150	Note 4.

* 30" of 34" copper wire.
Note 1. Some models may use a 390Ω resistor in this application.
Note 2. Some models may use a 10KΩ resistor in this application.
Note 3. Some models may use a 470KΩ resistor in this application.
Note 4. Not used in all models.
Note 5. Some models may use a 22KΩ resistor in this application.
Note 6. Some models may use a 12KΩ resistor in this application.
Note 7. Some models may use a 3.3Meg resistor in this application.
Note 8. Some models may use a 68KΩ, 1 watt resistor in this application.
Note 9. Some models may use a 4200Ω 5 Watt resistor in this application.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC	6.7VAC			32-8573					
	④ .62A	④ 8.9A			32-8573-1 ①					

① Alternate filament transformer

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	787.3Ω tap ⑤ 14Ω, 20.3Ω, 43.3Ω, 67.3Ω	0Ω	32-8634 ①	A-8230 ⑤			D-34 & WC-11 ②④		Horiz. Output Trans.
T3	375Ω tap ④ 10Ω		32-8625			T5O-16			Vert. Output Trans.
T4A	45Ω		32-8648	DY-12 ⑤	MDF-71⑤	TY-8 ⑤	Y-24 ⑤		Horiz. Deflection Coils
B	5Ω								Vert. Deflection Coils

① Includes L33.
② Connect as in original circuit except, connect original terminal #7 to new terminal #8, connect new terminal #7 to chassis ground.
④ Connect terminal #8 to terminal #7, then connect original 68Ω8 plate lead to terminal #9, original #2 to new #5, original #6 to new "T", original #1 to new #3. Connect primary of WC-11 across terminals #3 and #1, secondary to AFC. If the picture is out of phase reverse secondary connections.
⑤ Drill new mounting holes.
⑮ Use original deflection coil network, yoke plug and leads. Connect as in original circuit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T5	5.8KΩ	3.3Ω	500Ω	.7Ω	32-8578	A-3878	A-2930	RO-9 ①	S-3X	

① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	6"	PM	3.3Ω	36-1641-13 ①	674	6A21	① Some Models may use electro-dynamic speakers with a 600 field coil, in these models the speaker field is used for the filter choke.
B	10"	PM	3.3Ω	36-1646-8 ①②	10J11	10A31	② Used in Models A-T2275S, A-T1856W, A-T2272, A-UT2272, 22B4101, 22BU4101, 22B4301, 22B4303 & 22BU4303.
				36-1651 ①⑤			⑤ Used in models 18B3100, 18B3100L, 18B3100HM, 18BU3100, 18BU3100L, 18BU3100HM, 22B4100, 22B4100L, 22BU4100L.
				36-1641-10 ①④			④ Used in Models A-T1816, A-T2230, 18B3000, 18BU3000, 22B4000 & 22BU4000.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Trans.	.7Ω	.7Ω	32-4432-2				
L2	Ant. Trans.	.7Ω	.7Ω					Part of L1
L3	FM Trap	0Ω		32-4438-2				
L4	Ant. Coils	0Ω		76-7654				Includes wafer switch
L5	Fil. Choke	0Ω		32-4500-1				
L6	Neutr. Coil	0Ω		32-4550-10				
L7	RF Coils	0Ω		76-7656				Includes wafer switch
L8	Mixer Grid Coils	0Ω		76-7658				Includes wafer switch
L9	Fil. Choke	0Ω		32-4500-1				
L10	Osc. Coils	0Ω		76-7660				Includes wafer switch
L11	RF Choke	0Ω		32-4550-7				
L12	Conv. Plate	.1Ω		32-4359-13				
L13	IF Coupling	0Ω	0Ω	32-4548-29				
L14	23.1MC Trap	.1Ω		32-4486-27	20-1006		617A *	
L15	1st Video IF	.5Ω		32-4486-32	17-1003	TV-102 *	617A *	
L16	2nd Video IF	.2Ω		32-4486-30	17-1004	TV-103 *	6189 *	
L17	23.1MC Trap	0Ω		32-4498				Tapped
L18	Fil. Choke	.1Ω		32-4112-15	19-3001	TV-189	4606	2.5Microhenries
L19	3rd Video IF	.4Ω	.4Ω	32-4486-29	17-1064	TV-116	6250	
L20	4th Video IF	.5Ω	.4Ω	32-4486-33	17-1063	TV-116	6249	
L21	Series Peak. Coil	1.8Ω		32-4143-1	19-3038	TV-180	6176	40 Microhenries
L22	Series Peak. Coil	1.8Ω		32-4112-24			4608	4 Microhenries
L23	Series Peak. Coil	3.7Ω		32-4480-8	19-3125		6153	125 Microhenries
L24	Series Peak. Coil	1.8Ω		32-4112-24			4608	4 Microhenries (Not used in in all models)
L25	Variable Shunt Peak. Coil	10Ω		32-4467-17	19-1922		6160	200-400 Microhenries
L26	Series Peak. Coil	4.8Ω		32-4480-9	19-3180	TV-184	6180	180 Microhenries
L27	4.5MC Trap	1.7Ω		32-4483-2	20-1004	TV-151	1470	
L28	Variable Shunt Peak. Coil	5.5Ω		32-4467-18	19-1920		4563	60-300Microhenries
L29	Sound IF	4.4Ω		32-4483-10	20-1005	TV-161	1470	
L30	Ratio Det.	5Ω	.90CT	32-4450-8A	17-3497	TV-115	6205	Tertiary winding- 85Ω
L31	Fil. Choke	.1Ω		32-4112-16	19-3001	TV-189	4606	2.5Microhenries
L32	Horiz. Osc.	170Ω		32-4557	19-1576	TV-163	6210	
L33	RF Choke	1.8Ω					4624	Part of T2; 15.2 Microhenries
L34	RF Choke	1.8Ω		32-4112-24			4608	4 Microhenries
L35	RF Choke	1.8Ω		32-4112-24			4608	4 Microhenries

* Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ℄	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L36	.280A	40Ω	1.1HY	Part of Speaker	C-2326 ①	C-2996 ①	TR-1733 ①	C-22X

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA PHILCO PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.280A	34-8003-7	6Q4	1090A	6S300	300
M2	.280A	34-8003-16 ①				
		34-8003-7	6Q4	1090A	6S300	300
		34-8003-16 ①				

① Alternate selenium rectifier.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA PHILCO PART No. FUSE	PHILCO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	3AG S/B P/T	1 6/10A	45-2656-23		3150L 6 (3AG S/B P/T - 1 6/10A)		MDV 1 6/10	
M4	*							

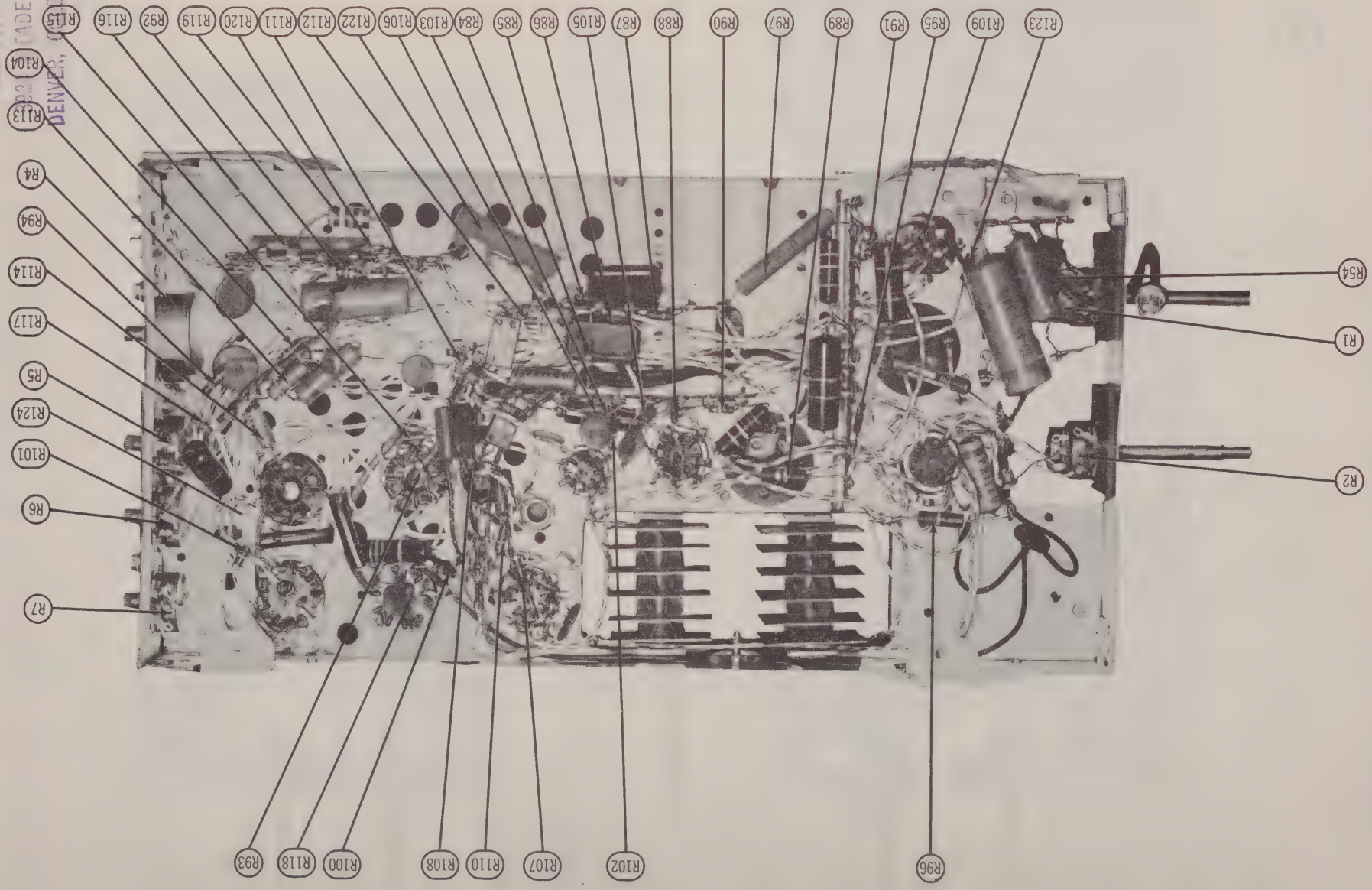
* Piece of #28 wire from pin 7 of interchassis socket to pin 6 of V17.

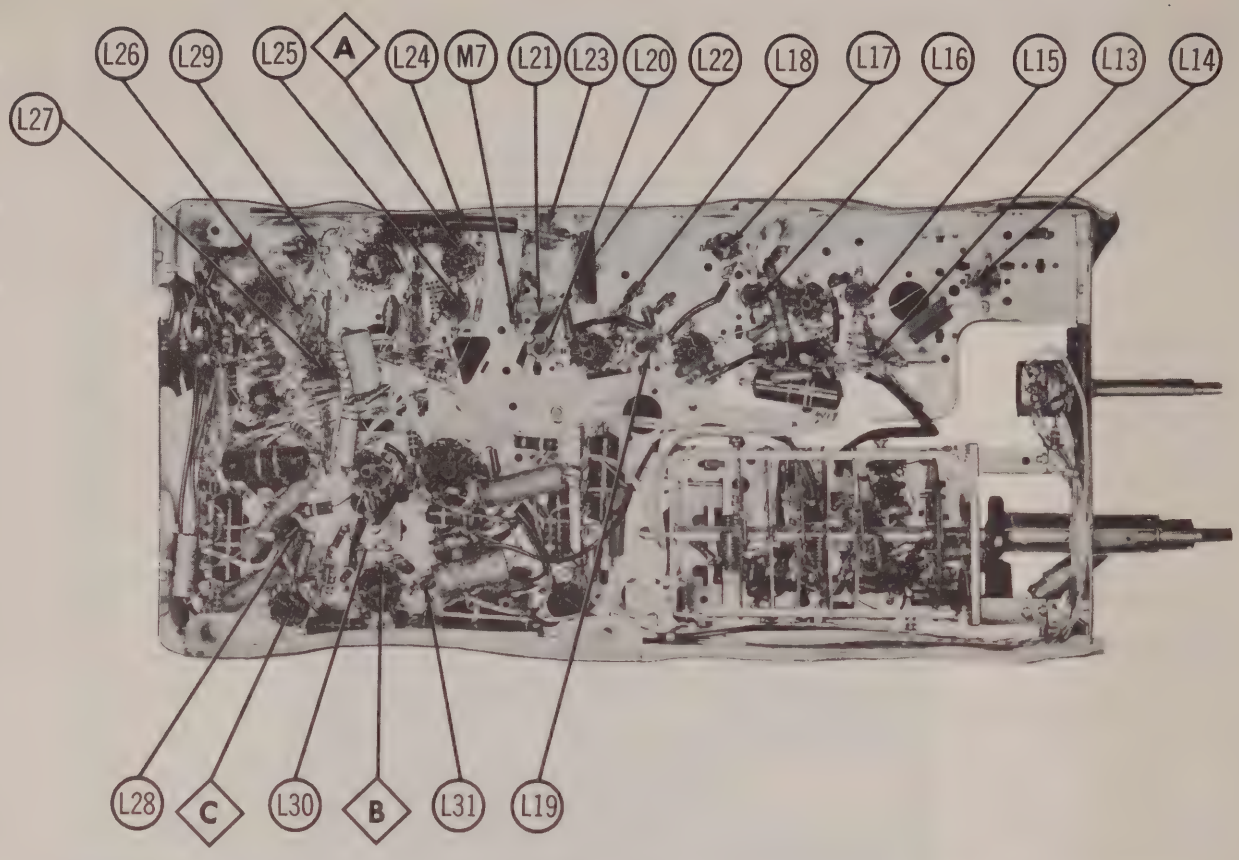
PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

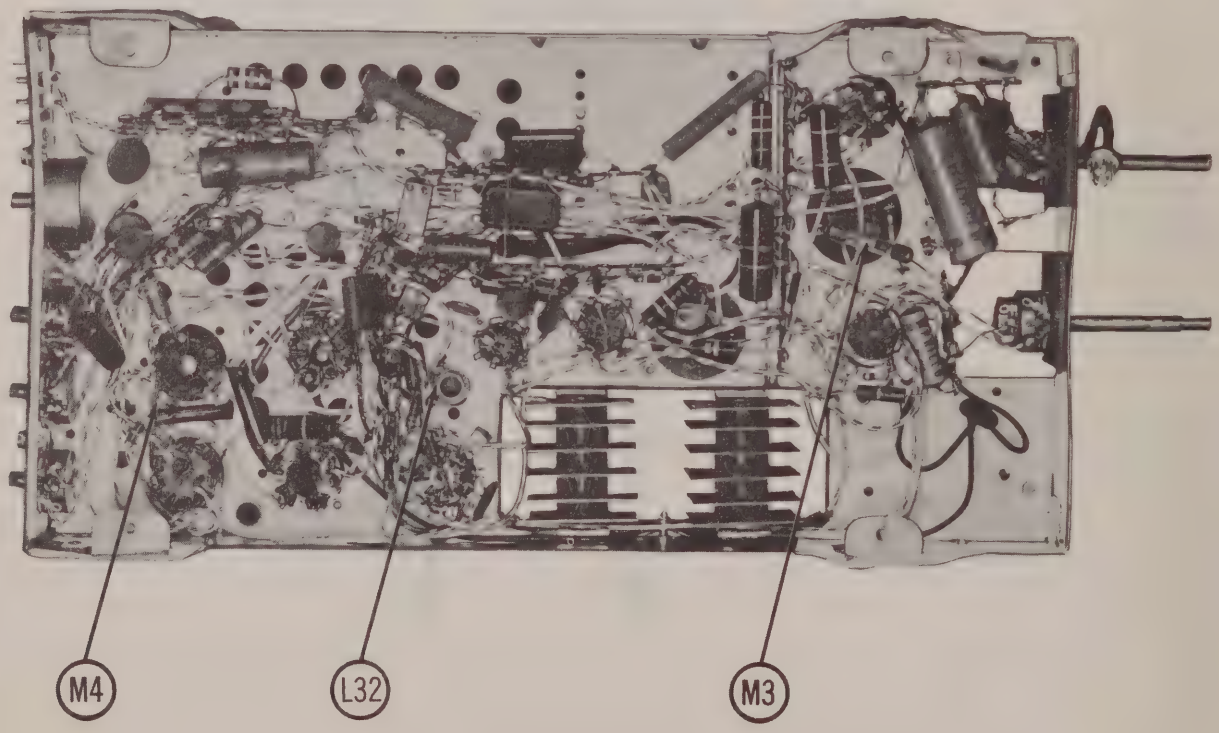
ITEM No.	PART NAME	PHILCO PART No.	NOTES
M5	Dial Light	34-2068	#47 (VHF)
M6	Tuner	76-7664	VHF
M7	Crystal	34-8022	1N64 Video Detector
M8	Focus Magnet	76-6126-4	Includes centering device
M9	Ion Trap	76-6077-2	
M10	Correction Magnet	76-6594	Two used
M11	Tuner	43-6778	UHF Adaptor UT21D
M12	Dial Light	34-2064	#47 (UHF) 2 used } Part of UHF Adaptor UT21D
M13	Crystal	34-8024	CP1-UHF mixer } Part of UHF Adaptor UT21D
M14	Switch	42-1996-4	UHF-VHF Changeover - wafer type } Part of UHF Adaptor UT21D
M15	Dial Light	34-2068	#47 Jewel
	Cabinet	10991	Mahogany- Models A-T2275S, 22B4101, 22BU4101
	Cabinet	10982-6	Metal - Models 18B3000, 18BU3000
	Cabinet	10982-8	Metal - Models 18B3001, 18BU3001
	Cabinet	10977	Mahogany - Model 18B3100
	Cabinet	10977-4	Light - Model 18B3100L, 18BU3100L
	Cabinet	10977-5	Honey-Maple - Models 18B3100HM, 18BU3100HM
	Cabinet	10977-3	Mahogany - Model 18BU3100
	Cabinet	10948-6	Mahogany - Models A-T2272, A-UT2272, 22B4303, 22BU4303
	Cabinet	10971-7	Mahogany - Model A-T2230
	Cabinet	10982-2	Metal - Model A-T1816
	Cabinet	10979-7	Walnut - Model A-T1856W
	Cabinet	10999	Metal - Models 22B4000, 22BU4000
	Cabinet	11012	Mahogany - Models 22B4100, 22BU4100
	Cabinet	11012-3	Light - Models 22B4100L, 22BU4100L
	Cabinet	10978-1	Mahogany - Model 22B4301
	Knob	54-4799-3	Brightness - Light cabinet Models
	Knob	54-4768	Brightness - Models 18B3000, 18BU3000
	Knob	54-4799	Brightness - Models (All other)
	Knob	76-6863-15	Channel Selector - Light cabinet models.
	Knob	76-6863-30	Channel Selector - Models 18B3000, 18BU3000
	Knob	76-6863-14	Channel Selector - All other models.
	Knob	76-6048-1	Contrast - Light cabinet models
	Knob	76-6048	Contrast - Models A-T1816, A-T2272, A-UT2272, A-T2275S 18B3100HM, 18BU3100HM, 22B4101, 22BU4101, 22B4301, 22B4303,
	Knob	54-4797	Contrast - Models A-T1856W, A-T2230, 18B3000, 18BU3000, 18B3001, 18BU3001, 18B3100, 18BU3100, 22B4000, 22BU4000, 22B4100, 22BU4100, 22B4303
	Knob	54-4803	Fine tuning - Models 18B3000, 18BU3000
	Knob	76-6104	Fine tuning - All other models
	Knob	76-6048-1	Horiz. Hold -Light cabinet models
	Knob	54-4797	Horiz. Hold - Models A-T1816, A-T1856W, A-T2230, 18B3000, 18BU3000, 18B3001, 18BU3001, 18B3100, 18U31000, 22B4000, 22BU4000, 22B4100, 22BU4100, 22B4101, 22B4303
	Knob	76-6048	Horiz. Hold - Models A-T2272, A-UT2272, A-T2275S, 18B3100HM, 18BU3100HM, 22B4000, 22BU4000, 22B4101, 22BU4101, 22B4301, 22B4303, 22BU4303
	Knob	76-6213	tone - Model A-T1856W
	Knob	54-4799-3	Vert. hold - Light cabinet models
	Knob	54-4768	Vert. hold - Models 18B3000, 18BU3000
	Knob	54-4799	Vert. Hold - All other models
	Knob	76-6581-2	Off/on/Volume - light cabinet models
	Knob	54-4804-3	Off/on/Volume - Models 18B3000, 18BU3000
	Knob	76-6581-1	Off/on/Volume - Models A-T1816, A-T2272, A-UT2272, A-2275S, 18B3100HM, 18BU3100HM, 22B4101, 22B4301, 22B4303
	Knob	76-6166	Off/on/Volume - Models A-T1856W, A-T2230, 18B3001, 18BU3001, 18B3100, 18BU3100, 22B4000, 22BU4000, 22B4100, 22BU4100, 22B4101, 22B4303
	Knob	76-8292	UHF tuning - Models 18BU3000, 18BU3001, 18BU3100, L, HM, 22BU4100, L
	Safety Glass	54-8293-3	Models A-T1816, 18B3000, 18BU3000, 18B3001, 18BU3001
	Safety Glass	54-7943-57	Model A-T1856W
	Safety Glass	54-7943-62	Model S A-T2230
	Safety Glass	54-7943-49	Models A-T2272, UT2272, 22B4301, 22B4303, 22BU4303
	Safety Glass	54-7943-64	Models A-T2275S, 22B4101, 22BU4101
	Safety Glass	54-7943-70	Models 18B3100, 18B3100L, 18B3100HM, 18BU3100, 18BU3100L, 18BU3100HM
	Safety Glass	54-8293-5	Models 22B4000, 22BU4000
	Safety Glass	54-7943-74	Models 22B4100, 22B4100L, 22BU4100, 22BU4100L

PROPERTY OF
L. F. BLANKENSHIP
[illegible] TADE ST.
DENVER, COLORADO





RF-IF CHASSIS-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



SWEEP CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3920 [illegible] ST
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, M4, switch on volume control and T1. If filaments light, check M1, M2, M3 and B+ filter and decoupling components.

SMALL AND/OR DIM PIX

Check M1, M2 and B+ filter and decoupling circuit and components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V15, V16, V17 and V18, Check waveform W15.

If Satisfactory	If Unsatisfactory
Check T2, T4A, R121, and other associated components.	Check C89, C90, C92, R107, R111, R115 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V15, V16, V17 and V18. Measure B+.

If Satisfactory	If Unsatisfactory
Proceed as outlined under "Loss of High Voltage".	Check M1, M2 and other associated components.

BLOOMING

Check by substitution V15, V16, V17 and V18. Check T2, T4A, R121, picture tube and other associated circuit components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5 and V6. Check video detector crystal and assembly. Check components associated with the video IF strip.

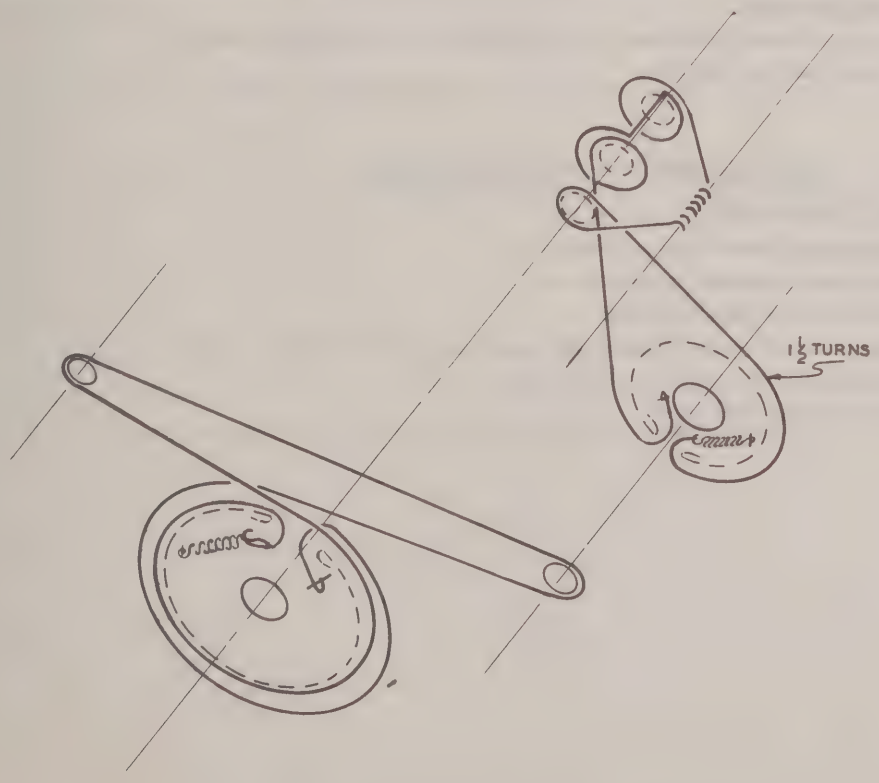
NO RASTER NO SOUND

See"Dead Set".

INTERMITTENT STREAKS

Check signal at W1 for interference pulses. Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.



UHF DRIVE CORD STRINGING

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removing the Channel Selector and Fine Tuning knobs.

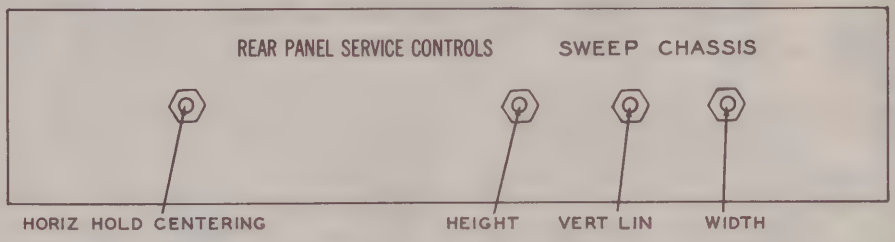
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 metal screws holding 4 metal corners. Remove safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust horiz. ringing coil slug (L32) until picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary (L30) located on top of chassis. (See tube placement chart).

FUSES

Two fuses are used-one for LV power supply protection. One piece of #26 wire heater protective link. (For Location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P.M. Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

ANTI-PIN CUSHION ADJUSTMENT

Reduce the picture size so that the side of the raster are visible, and position the magnets so that all sides are straight lines and the corners are at right angles.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type control knobs from front panel.
2. Remove spring clip. Remove safety shield from tuner shaft.
3. Disconnect antenna transmission line from rear cover.
4. Remove 13 metal screws. Remove rear cover.
5. Disconnect speaker, inter chassis connecting cable, vol cont. cable, yoke plug, CRT socket, HV lead.
6. Remove 8 chassis bolt. Remove both chassis (4bolts to each).
7. Remove 2 speaker nuts. Remove speaker.

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RCA VICTOR MODELS 3-BX-51, 3-BX-52, 3-BX-53, 3-BX-54 (Ch. RC-1126)

ON-OFF SWITCH
VOLUME CONTROL

TUNING CONTROL

RCA VICTOR MODELS 3-BX-51, 3-BX-52, 3-BX-53, 3-BX-54 (Ch. RC-1126)

TRADE NAME	RCA Victor Models 3-BX-51, 3-BX-52, 3-BX-53, 3-BX-54 (Ch. RC-1126)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N.J.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1T4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY RATING	115 Volts AC-DC (or) 7.5 Volts "A" Supply & 75 Volts "B" Supply in Pack Form .15 Amp. @ 115 Volts AC (or) 60 MA @ 7.5 Volts DC & 6MA @ 75 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if avialable. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Remove chassis from cabinet. Remove chassis bottom plate.
Shunt antenna section of tuning gang with a 10KΩ carbon resistor.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 6 (grid) of 1T4 (V2). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulatinn.
2.	"	High side to pin 6 (grid) of 1R5 (V1). Low side to chassis.	"	"	"	A2, A3	"
3.	Replace bottom cover and install chassis in cabinet. Connect loop antenna. The batteries should be in their proper place during the following steps.						
4.		Loop	1620KC	Tuning gang fully open	Across voice coil	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
5.		"	1400KC	Tune to 1400KC signal	"	A5	"
6.		"	600KC	Tune to 600KC signal	"	A6	Adjust for maximum deflection while rocking tuning gang thru 600KC signal.
7.	Repeat steps 4, 5 and 6, then remove 10KΩ shunt resistor from antenna section of tuning gang.						

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		RCA Victor PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1T4	1T4	6AR	
V3	Det-AVC-AF-Amp	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	150	77956	AFH4-32		DO27		FP411		
B	■30	150								
C	▲40	150								
D	120	25								
C2	.047	400	73553	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C3	56		75784	S156	D6-560		GP1K-560	UC-5456	5GA-Q56	
C4	.047	400	73553	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C5	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C6	.047	200	73553	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C7	.0022	600	73595	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C8	100	500	39628	1468-0001		5W5T1		MC235	1FM-31	
C9	.0047	400	73920	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C10	.047	400	75071	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C11	.1	400	73551	P488-1		PTE4P1		PT401	4TM-P1	
C12	.1	200	73551	P488-1		PTE4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg		74285	Q13-137	AG-63-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

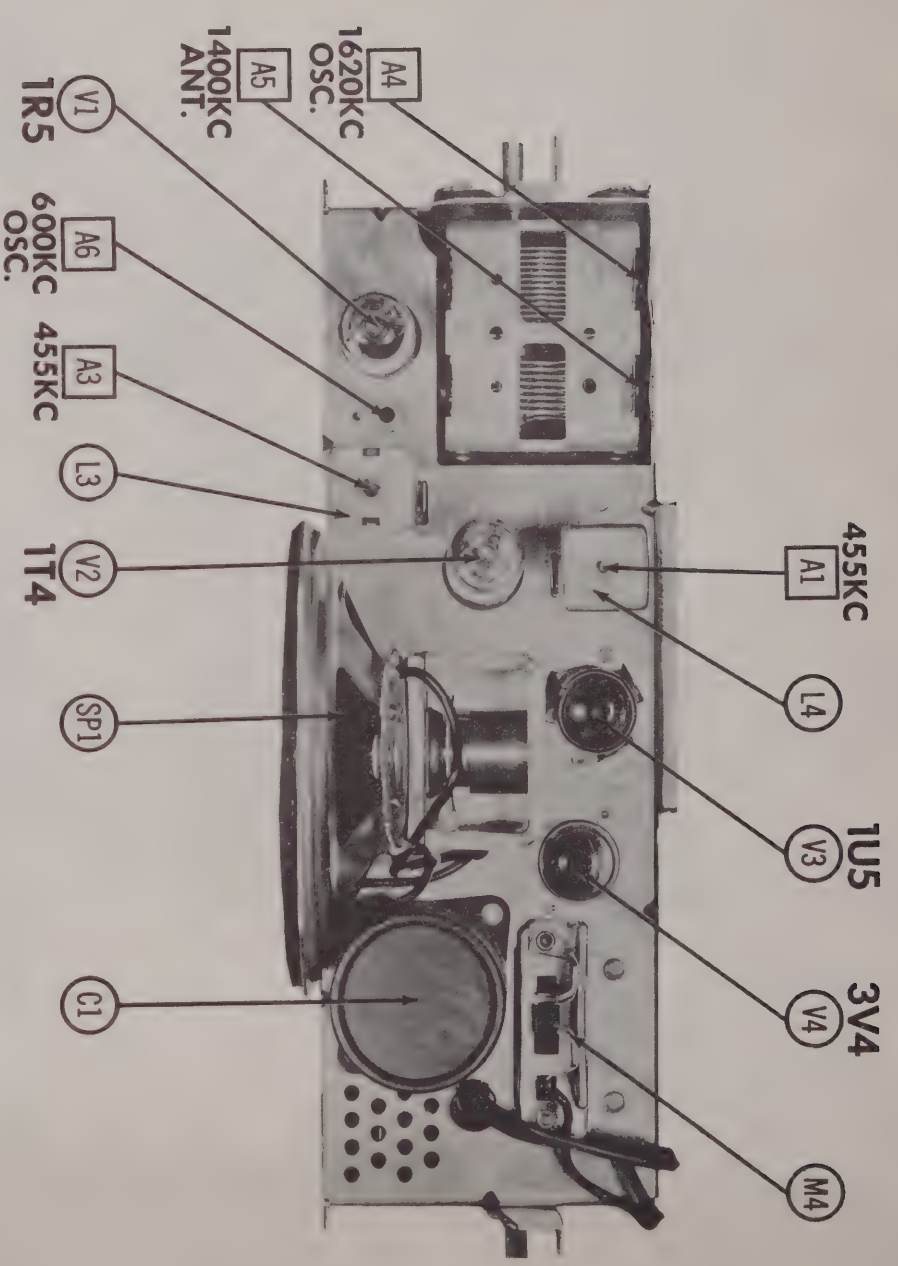
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R2	100KΩ	½	503410	BTS-100K	
R3	1000Ω	½	503210	BTS-1000	
R4	22KΩ	½	503322	BTS-22K	
R5	3.9Meg	½	503539	BTS-3.9Meg	
R6	47KΩ	½	503347	BTS-47K	
R7	10Meg	½	503610	BTS-10Meg	
R8	10Meg	½	503610	BTS-10Meg	
R9	1Meg	½	503510	BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R10	470K	½	503447	BTS-470K	
R11	680Ω	½	503168	BTS-680	
R12A	1300Ω	3.5	74777		
B	1300Ω	3.5			
R13	2200Ω	½	503222	BTS-2200	
R14	33Ω	1	513033		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	10KΩ	3.2Ω	420Ω	.55Ω	74779	A-3329	A-2998	RO-301 ①	S-11X	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	77959	ST-113 Mod. P4-X	4A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3Ω		74789				Note 1
L2	Osc. Coil	1.3Ω	6.5Ω	74405	14-1028 *		71-Osc.	
L3	Input IF	20Ω	20Ω	73129	16-6758	BC-352	12-C1	
L4	Output IF	25Ω	12Ω	74775	16-6770	BC-355	12-C6	

Note 1. Cabinet back complete with loop (part # 77967 for model 3BX51).
Cabinet back complete with loop (part # 78017 for model 3BX52).
Cabinet back complete with loop (part # 78019 for model 3BX53).
Cabinet back complete with loop (part # 78021 for model 3BX54).

* Requires new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				
	CURRENT	RCA Victor PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.062A	77958	5M4	1003	6S75	75

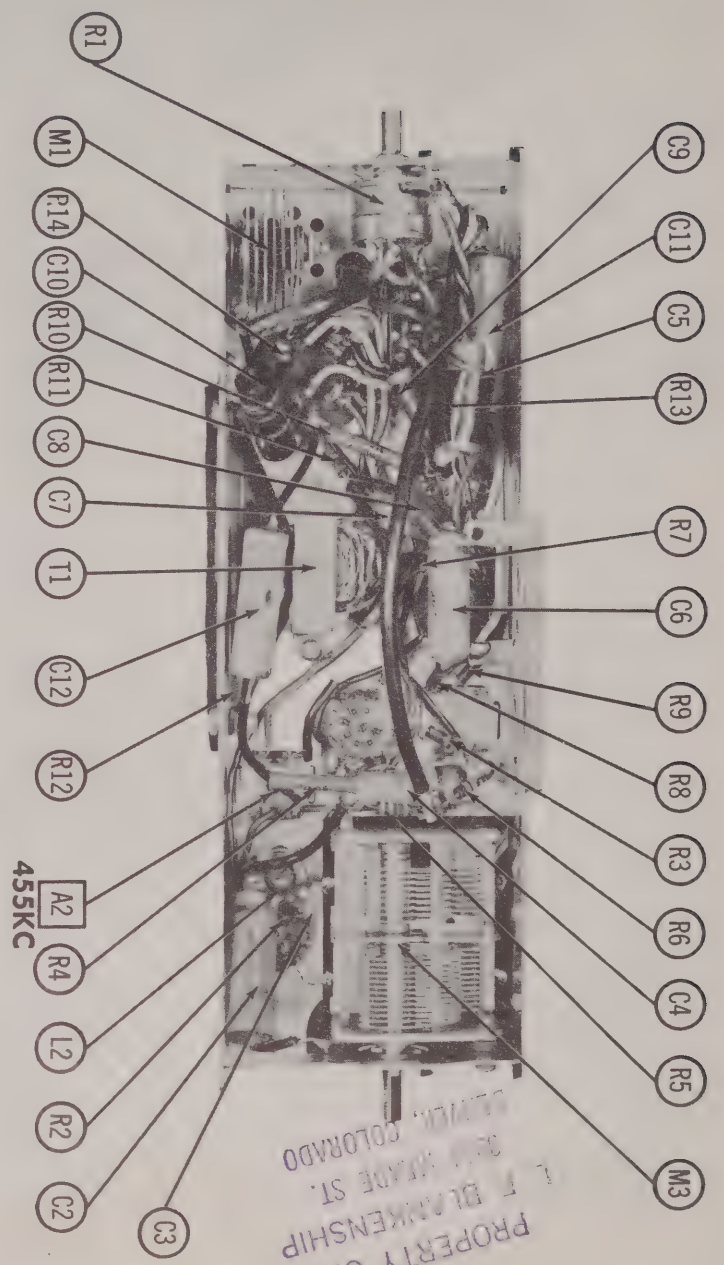
BATTERIES

ITEM No.	VOLTAGE	RCA Victor PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7.5 V"A" 75V "B"	VS 050			755			T5Z50	

MISCELLANEOUS

ITEM No.	PART NAME	RCA- Victor PART No.	NOTES
M3	Tuning cap	77957	2 gang (32-442MMF, 21-125MMF)
M4	Switch	71039	Power selector-slide type
	Cabinet	77966	Front-brown model 3BX51
	Cabinet	78016	Front-tan model 3BX52
	Cabinet	78018	Front-green model 3BX53
	Cabinet	78020	Front-red model 3BX54
	Cabinet	77967	Back-brown model 3BX51
	Cabinet	78017	Back- tan Model 3BX52
	Cabinet	78019	Back -Green Model 3BX53
	Cabinet	78021	Back -Red Model 3BX54
	Knob	77964	Tuning-tan model 3BX51
	Knob	78011	Tuning-brown model 3BX52
	Knob	78013	Tuning-grey model 3BX53
	Knob	78015	Tuning-red model 3BX54
	Handle	77962	Carrying-tan model 3BX51
	Handle	78007	Carrying-brown model 3BX52
	Handle	78008	Carrying-grey model 3BX53
	Handle	78009	Carrying-red model 3BX54
	Knob	77963	Off-on vol. -tan model 3BX51
	Knob	78010	Off-on vol. -brown model 3BX52
	Knob	78012	Off-on vol. -grey model 3BX53
	Knob	78014	Off-on vol. -red model 3BX54

CHASSIS—BOTTOM VIEW



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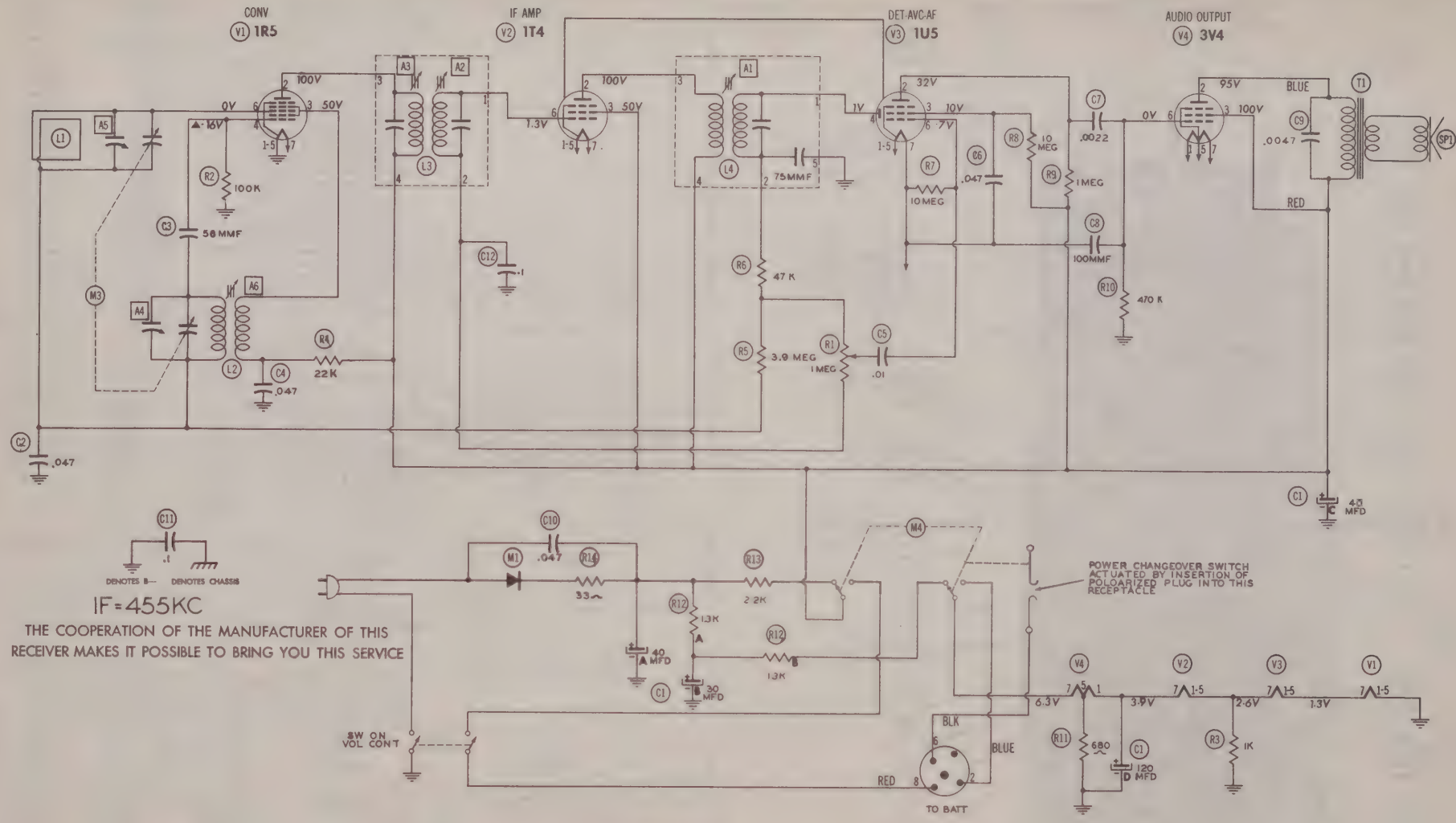
RCA VICTOR
MODEL 3-BX-51 (Ch. RC-1126)



IF=455KC

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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0Ω	†2.2KΩ	†24.2KΩ	100KΩ	0Ω	4.9Meg	*
V 2	1T4	*	†2.2KΩ	†24.2KΩ	INF	*	120Ω	*
V 3	1U5	*	†1Meg	†10Meg	1Meg	INF	10Meg	*
V 4	3V4	*	†2.6KΩ	†2.2KΩ	*	*	470KΩ	*

▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1
¶ MEASURED ACROSS SECONDARY OF L3

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227-11

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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MODEL 3151B

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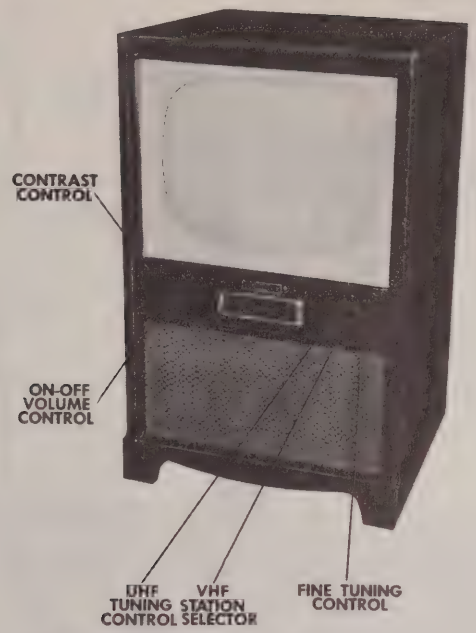

SILVERTONE MODEL 3151B

TRADE NAME	Silvertone	MODELS	CHASSIS
		3109	528.264
		3110B, 3150L, 4111, 4126	528.264-1, -2
		3112B, 3115IB, 3151C, 4113, 4118, 4127	528.263-1, -2
		3170D	528.261
		4114, 4128	528.264-2
		4115, 4139, 4149	528.270
		4116, 4117	528.266
		4119, 4129	528.263-2
		4131	528.263-1
		4140D, 4143D, 4145D	528.266-1
		4150D, 4153D, 4155D	528.286

SUPPLIER	Sears Roebuck Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Twenty-three
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 1.98 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83UHF, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier)

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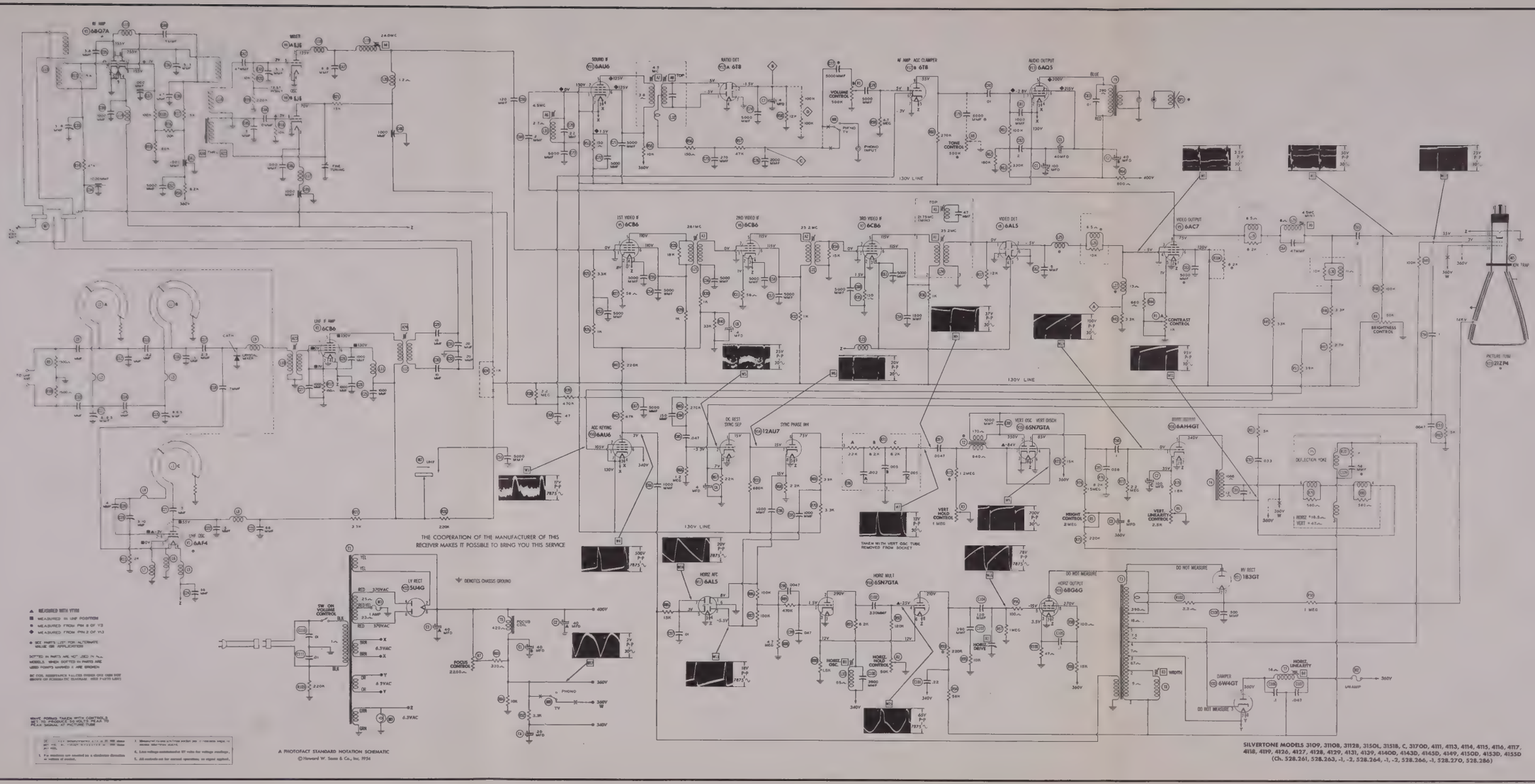
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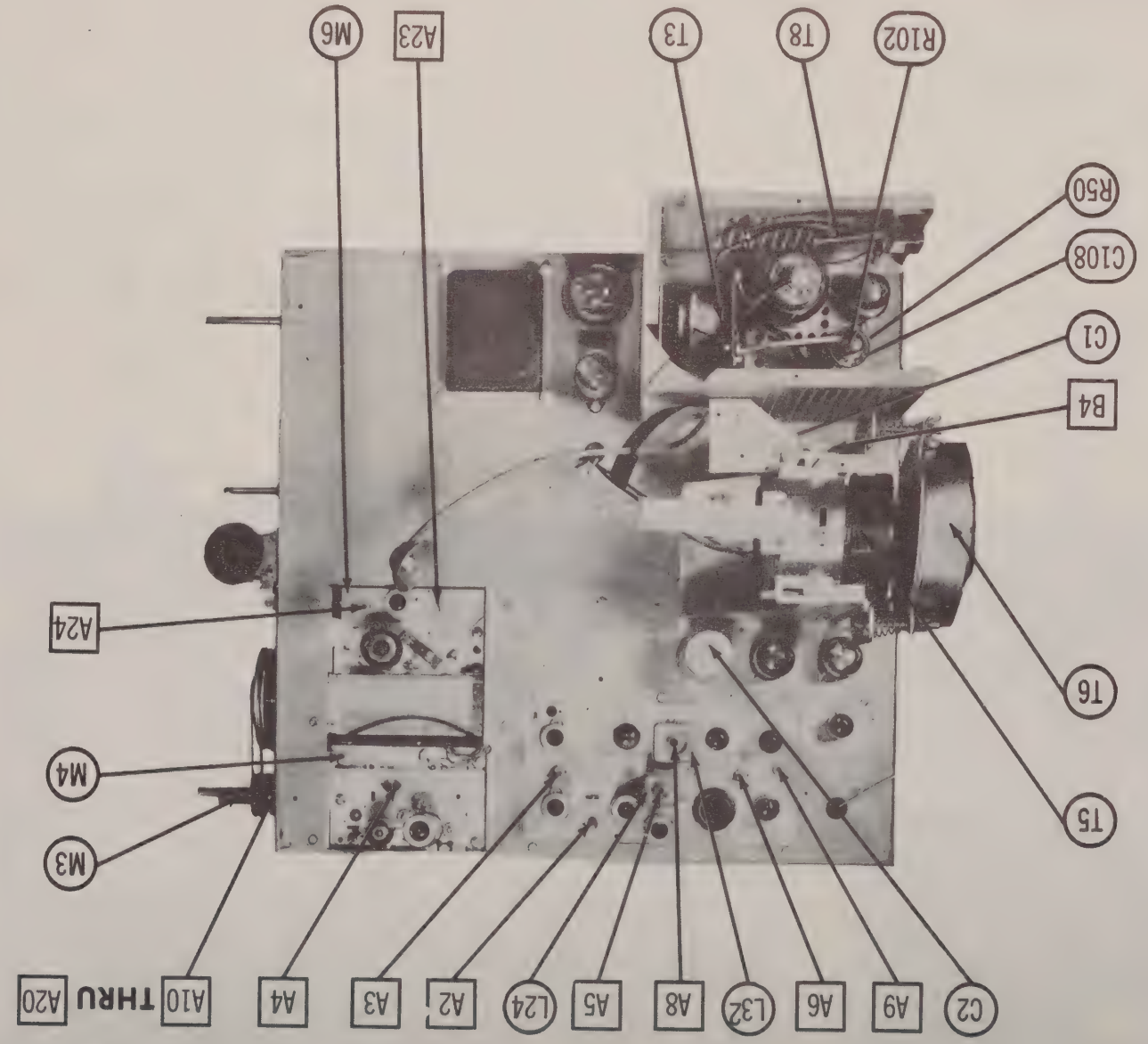
CHASSIS TOP VIEW



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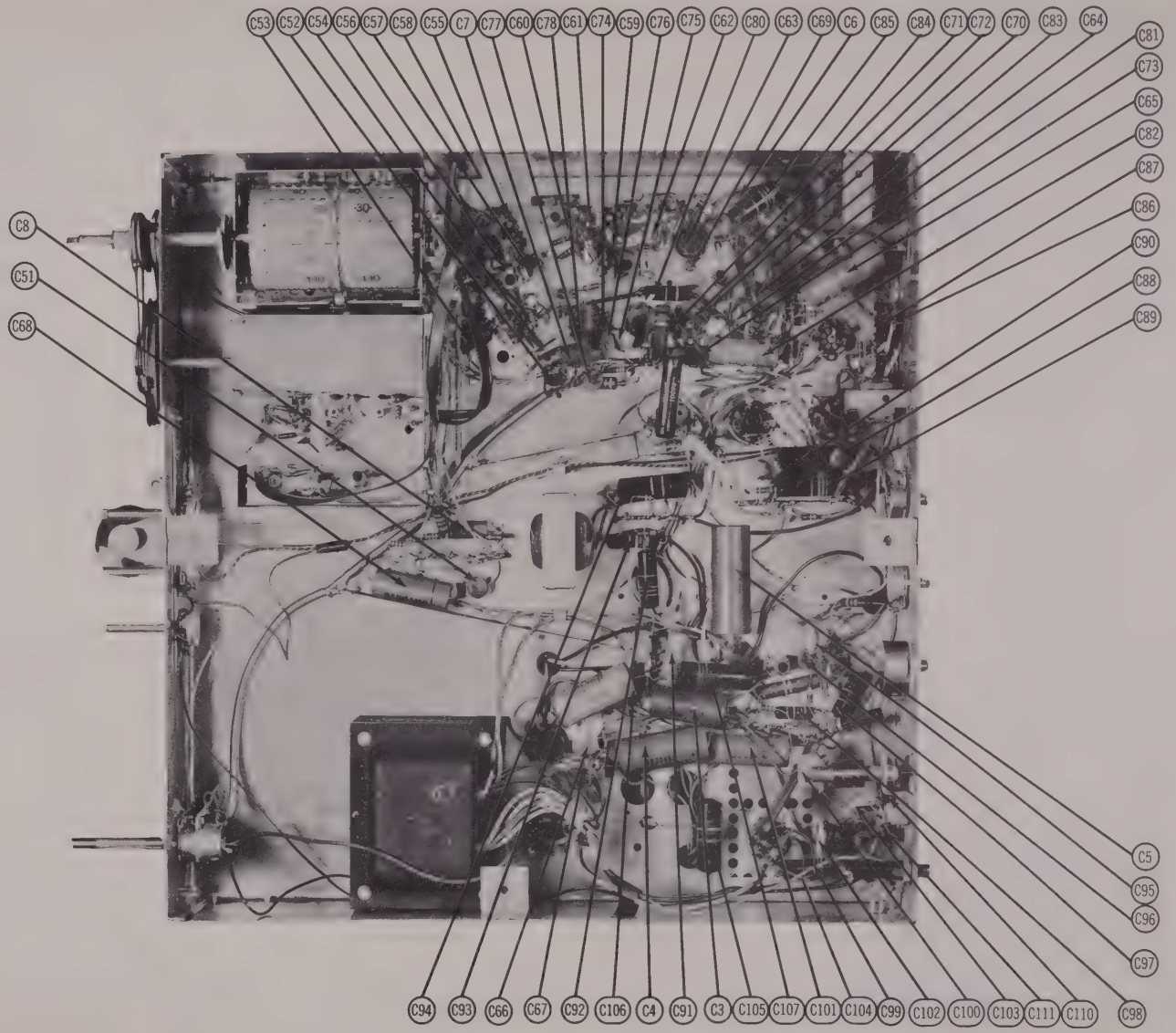

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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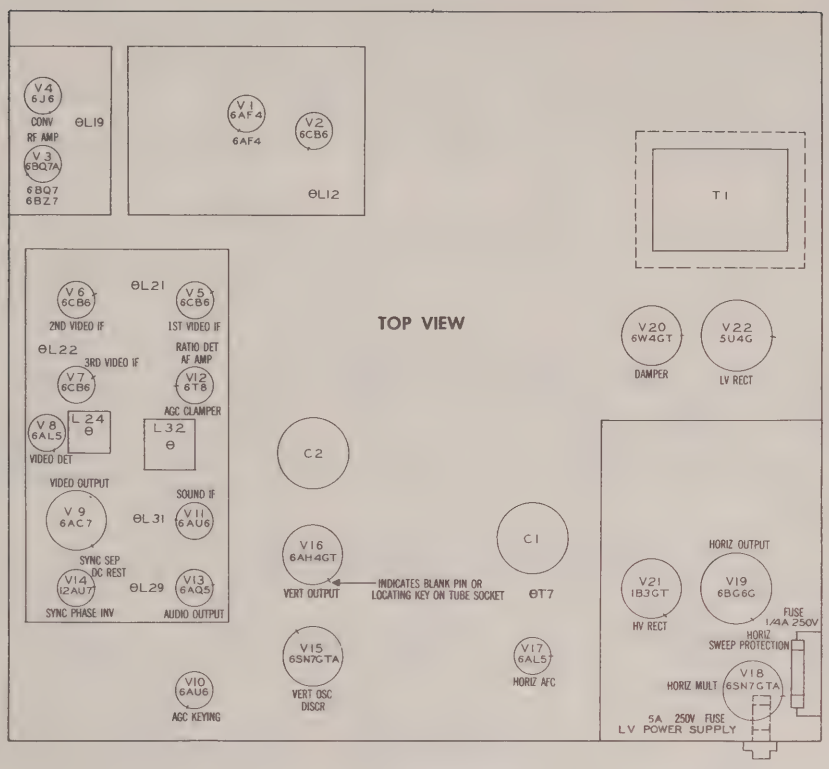

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V4, V5, V6, V7, V8, V9, V13 (V1, V2, UHF only)
No pic, no sound, has snow - V3, V4, V5
No pic, has sound, has raster - V9, V23
Has pic, no sound - V11, V12, V13
Overloaded picture - V10

SYNC FAILURE
No vert. sync - V14, V15, V16
No horiz. sync - V14, V17, V18
No vert. or horiz. sync - V14

SWEEP FAILURE
No raster, has sound - V18, V19, V20, V21, V23, Fuse (M2)
No vertical deflection - V15, V16
Poor vert. linearity or foldover - V15, V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22
Vert. off freq. - V14, V15, V16
Horiz. off freq. - V14, V17, V18

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V4) from its socket and replace with a 6J6 which has Pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C8. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.2MC (Unmod.)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.2MC	"	"	A2	"
3.	"	"	26.1MC	"	"	A3	"
4.	"	"	24.0MC	"	"	A4	"
5.	"	"	21.75MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.75MC 26.25MC	Any	Vert. amp to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A1 thru A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B). Common to chassis.	A6, A7	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (C). Common to point (D).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp to point (B). Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
8.	"	"	"	"	"	Vert. amp to point (C). Low side to chassis.	A8	Reconnect stabilizer capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig. 4) to pin 11 of picture tube. Common to chassis.	A9	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Connect the bias battery as under video alignment.
Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp to point (A). Low side to chassis.	A10	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A11	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A12	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A13	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A14	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A15	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A16	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A17	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A18	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A19	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A20	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A21	

ALIGNMENT INSTRUCTIONS (cont)

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RF ALIGNMENT

The RF and mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF ALIGNMENT

Switch channel knob to UHF position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistor	Across UHF antenna terminals with 120Ω in each lead.	124MC (Unmod)	UHF	DC probe to point (A). Common to chassis.	A22	Remove 6AF4 (V1) from its socket. Adjust for maximum deflection. Replace 6AF4 (V1).
12.	"	"	647MC (Unmod)	Tune for maximum deflection on VTVM	"	A23,A24	Adjust for maximum deflection.

UHF ON THE AIR ADJUSTMENTS

1. Tune in a UHF station.
2. Adjust A23 and A24 for best sound and clearest picture.

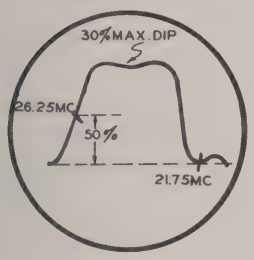


FIG.1

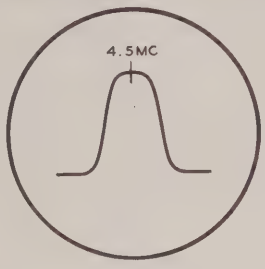


FIG.2

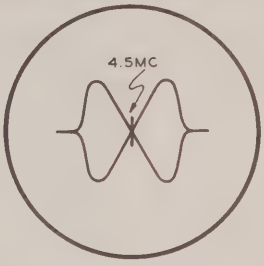


FIG.3

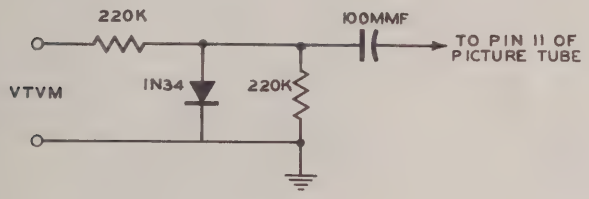


FIG. 4

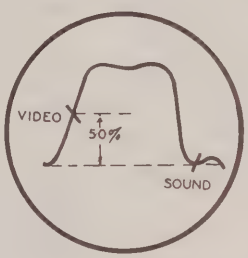
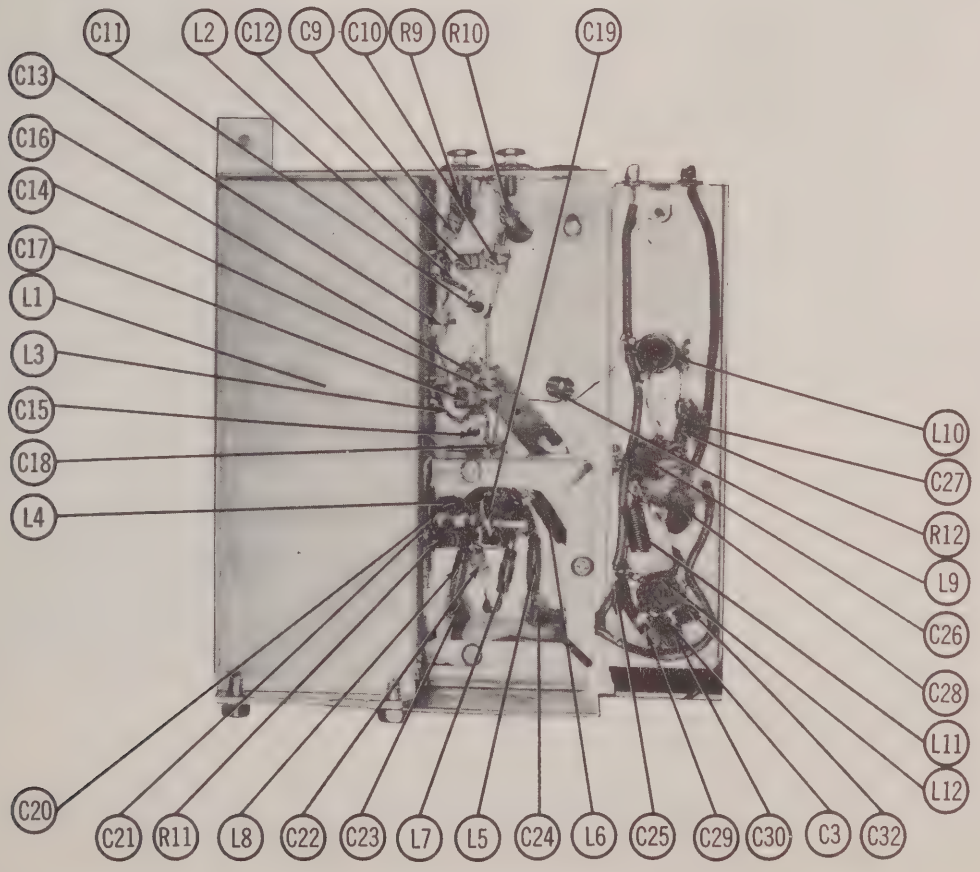


FIG. 5



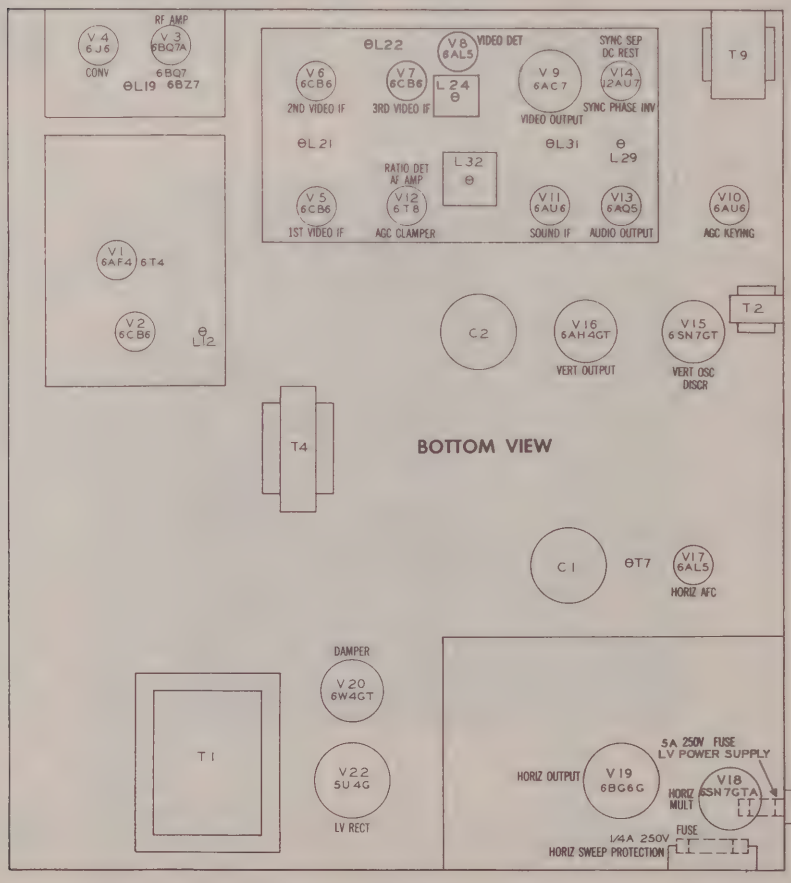
UHF TUNER

SILVERTONE MODELS 3109, 3110B, 3112B, 3150L, 3151B, C, 3170D, 4111, 4113, 4114, 4115, 4116, 4117, 4118, 4119, 4126, 4127, 4128, 4129, 4131, 4139, 4140D, 4143D, 4145D, 4149, 4150D, 4153D, 4155D (Ch. 528.261, 528.263, -1, -2, 528.264, -1, -2, 528.266, -1, 528.270, 528.286)

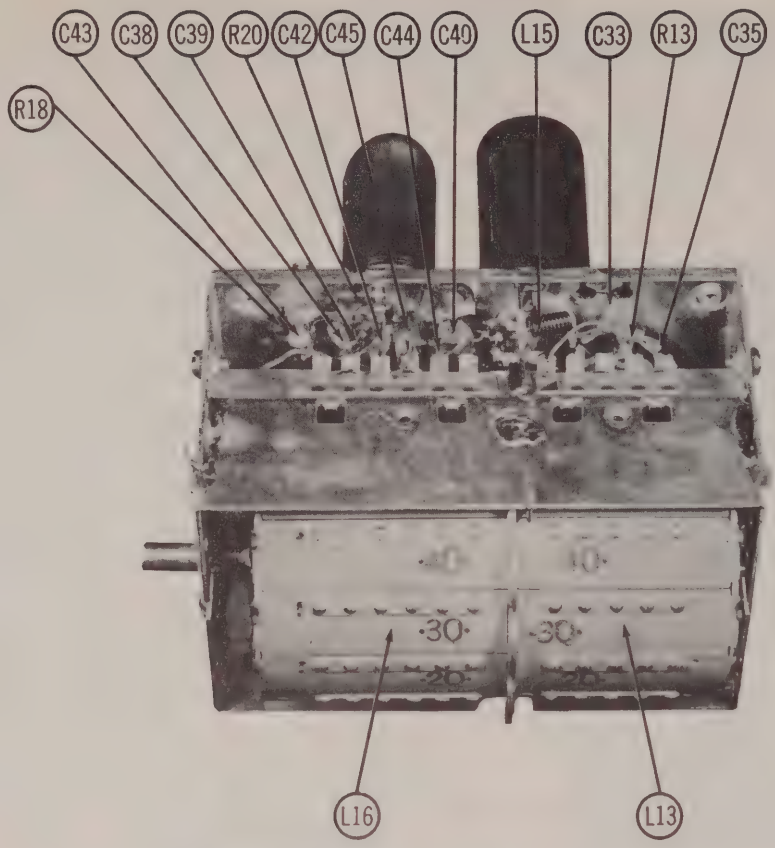
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	■†3.3KΩ	12KΩ	.1Ω	.2Ω	0Ω	■12KΩ	■†3.3KΩ		
V 2	6CB6	0Ω	150Ω	.1Ω	0Ω	■†0Ω	■†0Ω	150Ω		
V 3	6BQ7A	INF	670KΩ	0Ω	.1Ω	0Ω	††10KΩ	160KΩ	INF	0Ω
V 4	6J6	†16KΩ	†1KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 5	6CB6	37KΩ	56Ω	.1Ω	0Ω	†1KΩ	†1KΩ	0Ω		
V 6	6CB6	34KΩ	56Ω	0Ω	.1Ω	†1KΩ	†1KΩ	0Ω		
V 7	6CB6	.3Ω	150Ω	0Ω	.1Ω	†1KΩ	†1KΩ	0Ω		
V 8	6AL5	.6Ω	0Ω	.1Ω	0Ω	0Ω	0Ω	3.3KΩ		
V 9	6AC7	0Ω	0Ω	0Ω	3.3KΩ	76Ω	†0Ω	.1Ω	†6KΩ	
V 10	6AU6	†42KΩ	†0Ω	†0Ω	†0Ω	300KΩ	††3.7KΩ	†0Ω		
V 11	6AU6	†2.7Ω	†0Ω	†0Ω	†0Ω	††10.5KΩ	††10.5KΩ	†150Ω		
V 12	6T8	INF	12KΩ	INF	0Ω	.1Ω	630KΩ	0Ω	4.7Meg	†270KΩ
V 13	6AQ5	††220KΩ	40KΩ	40KΩ	40KΩ	††1KΩ	††800Ω	††220KΩ		
V 14	12AU7	†680KΩ	1.2Meg	22KΩ	0Ω	0Ω	†7.2KΩ	†680KΩ	2.2KΩ	.1Ω
V 15	6SN7GTA	1.5Meg	††15.5KΩ	0Ω	1.5Meg	¶3Meg	0Ω	.1Ω	0Ω	
V 16	6AH4GT	2.2Meg	0Ω	INF	INF	††1.5KΩ	INF	.1Ω	2.8KΩ	
V 17	6AL5	4.8Meg	4.8Meg	0Ω	.1Ω	15KΩ	0Ω	15KΩ		
V 18	6SN7GTA	5.2Meg	††12KΩ	1.5KΩ	150KΩ	¶275KΩ	1.5KΩ	0Ω	.1Ω	
V 19	6BG6G	INF	.1Ω	47Ω	††15.4KΩ	1Meg	1Meg	0Ω	††15.5KΩ	TOP CAP ¶16Ω
V 20	6W4GT	INF	INF	600KΩ	¶7.5Ω	††350Ω	INF	¶15Ω	¶15Ω	
V 21	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ¶405Ω
V 22	5U4G	INF	9.5KΩ	INF	25Ω	INF	23Ω	INF	9.5KΩ	
V 23	21ZP4	0Ω	122KΩ	PIN 10 ††350Ω	PIN 11 †140KΩ	PIN 12 .1Ω				

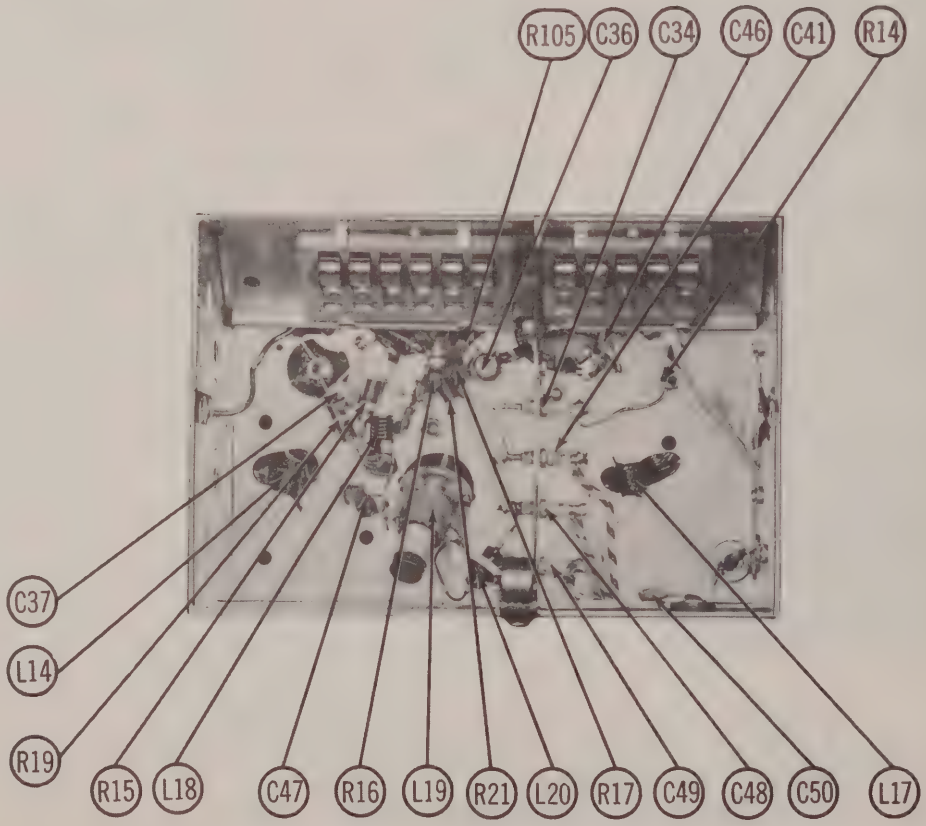
ALL MEASUREMENTS TAKEN IN VHF POSITION UNLESS NOTED
■ MEASURED IN UHF POSITION
† MEASURED FROM PIN 2 OF V13
†† MEASURED FROM PIN 8 OF V22
¶ MEASURED FROM PIN 3 OF V20



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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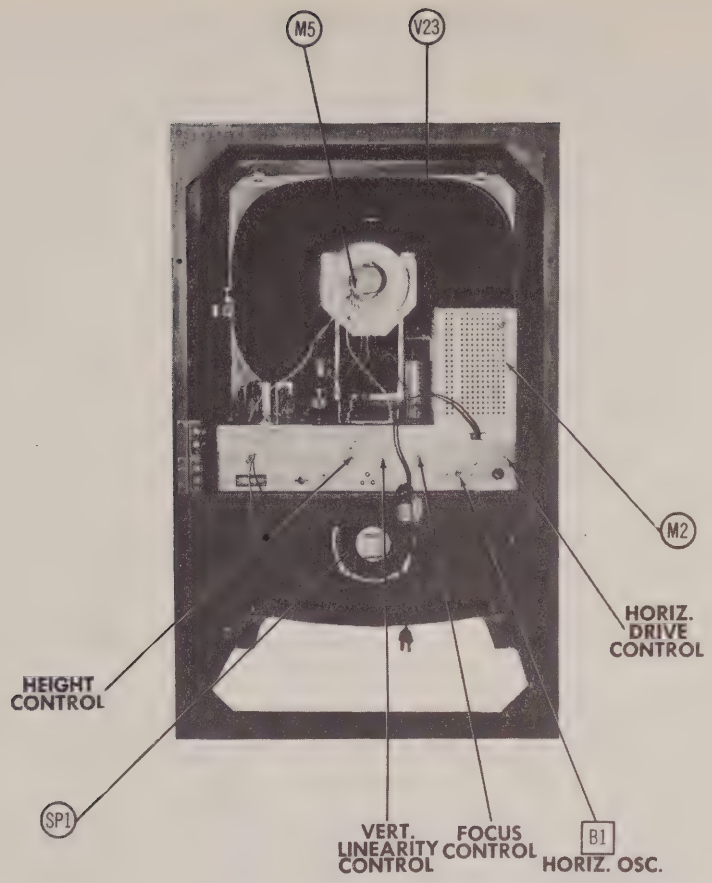

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably a test pattern.
2. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator slug (B1) until the picture synchronizes horizontally.
3. Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines or compression of the center of the picture. Repeat step 2.
4. Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V18, V19, V20 and V22. Check adjustments B2, B3 and B4. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check R99, C105, C106, C107, T3, T5A and other associated components.	Check C102, C103, C104, R93, R94, R97 and other associated components.

DRIVE LINES

Check by substitution V18, V19 and V20. Check T3, T5A, C106, C107,C103, C102, C104 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V19 and V20. Check T3, T5A and other components associated with the horizontal output and damper stages.

FOLDS

See "Drive Lines".

XMAS TREE EFFECT

Substitute V18. Check C100, C102, L33 and other associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V15 and V16. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other components associated with V16.	Check C90, R74, R75, R77 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V15 and V16. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V15 and V16. Check C89, C90, R76 and R77. Check other associated circuit components.

COMPRESSED AT TOP

Check by substitution V15 and V16. Check T4, T5B, C2C and other associated circuit components.

FOLDS

Check by substitution V15 and V16. Check components associated with these stages for change of value or failure.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Substitute V14. Check associated components especially C85, R66, R67, R68, and R69.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V14 and V15. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check components associated with V15.	Check vertical integrator network and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V17 and V18. Check waveform W13.

If Satisfactory	If Unsatisfactory
Check components associated with V18.	Check C95, C96, R86, R87 and other associated circuit components.

HORIZONTAL BENDING

Check by substitution V17, V18 and V19. Check horizontal AFC network (R88, R89, C98 and C99) for change of value or failure.

VIDEO

LOSS OF VIDEO

Check R48, R4, C65, picture tube and associated circuit components.

SOUND BARS (4. 5MC BEAT)

Check adjustment of fine tuning. Check adjustment A9. Check video IF alignment.

NEGATIVE PIX

Check by substitution V8 and V9. Check AGC network for proper operation. Check components associated with V8 and V9.

POOR CONTRAST (STRONG SIGNAL AREAS)

Check V5, V6, V7, V8 and V9. Check components associated with these stages.

SMEAR

Check by substitution V8 and V9. Check L28, L30, C62, C65, R46, R48, picture tube and other associated circuit components.

WIDE BLACK BAR ACROSS

Check V3, V4, V5, V6, V7, V8 and V9 for heater to cathode leakage. In case of UHF check V1 and V2.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12 and V13. Check stages of V12B and V13 using an audio signal generator. Apply audio signal across R59.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components .	Check components associated with V12B and V13.

BUZZ

Adjust A8 for minimum buzz. If buzz is still objectionable, substitute V12 and readjust A7 and A8. Follow procedure outlined in the alignment section.

DISTORED

Follow procedure outlined under "Weak or No Sound".

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	UHF Oscillator	6AF4	6AF4	7DK	
V 1B	UHF Oscillator	6T4	6T4	7DK	
V2	UHF IF Amplifier	6CB6	6CB6	7CM	
V3A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BQ7	6BQ7	9AJ	
C	RF Amplifier	6BZ7	6BZ7	9AJ	
V4	Converter	6J6	6J6	7BF	
V5	1st Video IF Amp.	6CB6	6CB6	7CM	
V6	2nd Video IF Amp.	6CB6	6CB6	7CM	
V7	3rd Video IF Amp.	6CB6	6CB6	7CM	
V8	Video Detector	6AL5	6AL5	6BT	
V9	Video Output	6AC7	6AC7	8N	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Detector-AF Amplifier-AGC Clamper	6T8	6T8	9E	
V13	Audio Output	6AQ5	6AQ5	7BZ	
V14	Sync Separator-DC Restorer-Sync Phase Inc.	12AU7	12AU7	9A	
V15	Vert. Oscillator-Vert. Discharge	6SN7GTA	6SN7GTA	8BD	
V16	Vert. Output	6AH4GT	6AH4GT	8EL	
V17	Horiz. AFC	6AL5	6AL5	6BT	
V18	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V19	Horiz. Output	6BG6G	6BG6G	5BT	
V20	Damper	6W4GT	6W4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V23A	21ZP4	21ZP4	21ZP4	12D	① Circuit changes necessary.
		21ZP4A ①	21ZP4A ①	12D	
B	21ZP4B	21ZP4B	21ZP4B	12D	
C	21AP4	21AP4	21AP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	T18-295	AFH3-159		C118		FP375	TVL-3764	
B	■40	450								
C	▲100	200								
C2A	▲40	450	T18-295	AFH3-159		C118		FP375	TVL-3764	
B	■40	450								
C	▲100	200								
C3	8	500	T18-298	PRS500/8		BR850A		TC82	TVA-1902	
C4	20	450	T18-276	PRS450/20		BR2045A		TC75	TVA-1709	
C5	40	400	T18-308	PRS450/40		BR4045A		TC78	TVA-1712	
C6	4	50	T18-292	PRS150/4		BR415		TC30	TVA-1402	
C7	4	50	T18-292	PRS150/4		BR415		TC30	TVA-1402	
C8	4	50	T18-292	PRS150/4		BR415		TC30	TVA-1402	
C9	1			SI1NP0	TCZ-1		NP0K-010		5TCCB-V1	
C10	1			SI1NP0	TCZ-1		NP0K-010		5TCCB-V1	
C11	.8-6.5									
C12	1			SI1NP0	TCZ-1		NP0K-010		5TCCB-V1	
C13	.42									
C14	.25									
C15	.8-6.5									
C16	1.5									
C17	2.5									
C18	.7									
C19	3-10									
C20	4									
C21	15									
C22	15									
C23	68			SI68	D6-680		GP1K-680	UC-5468	5GA-Q68	
C24	68			SI68	D6-680		GP1K-680	UC-5468	5GA-Q68	
C25	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C26	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C27	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C28	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C29	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C30	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C31	20									
C32	20									
C33	3-8				829-10					
C34	1000			EF-001	MFT-1000				503C-D1	
C35	3.6									
C36	.5-3				829-3			CT565A		
C37	1000			EF-001	MFT-1000				503C-D1	
C38	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C39	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C40	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5		5TCCB-V15	
C41	1000			EF-001	MFT-1000				503C-D1	
C42	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C43	.5-3				829-3			CT565A		
C44	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C45	5									
C46	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C47	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C48	1000			EF-001	MFT-1000				503C-D1	
C49	1000			EF-001	MFT-1000				503C-D1	
C50	120			BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C51	5000		T16-177	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C52	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C53	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D6	
C54	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C55	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C56	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C57	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C58	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C59	1500		T16-341	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C60	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C61	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C62	5		T15-323	S15NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCD-V47	
C63	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	Note 1
C64	47			S147NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	
C65	.2	600	T16-212	584-2				PT622	6TM-P2	
C66	1000		T15-330	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C67	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C68	.47	200	T16-340	P288-47		PJ2P5		PT406	2TM-P47	
C69	5									
C70	22			S22NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C71	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C72	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C73	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C74	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C75	370		T15-343							
C76	2000		T15-328	BPD-002	DD-202	TM5D2	801-002	DC-523	5HK-D2	
C77	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D6	Note 2
C78	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D6	
C79	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	Note 3
C80	.01	600	T16-327	P688-01	D6-103	PT6E81	GP2-333-103	PT611	6TM-S1	
C81	1000		T15-330	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C82	.3	400	T16-188	684-2		PT6F4P32		PT402	4TM-P32	
C83	.01	600	T16-327	P688-01	D6-103	PT6E81	GP2-333-103	PT611	6TM-S1	
C84	150	500	T15-335	1468-00015	D6-151	SWT15	GP2K-151	MC239	1FM-S15	
C85	.047	600	T16-335	P688-047	DF-503	PT6S47		PT647	6TM-S47	
C86A	.002					PT6ED2		PT622		
B	.005		♦T17-196	♦PA-110	♦PC-100	PT6ED5	♦1405-01	PT625	♦10IC1	
C	.005					PT6ED5		PT625		
C87	.0047	600	T16-233	1464-005		LDR5D4		MCB465	MS-34	
C88	5000		T16-177	BPD-006	MD-502	TM5D5	811-006	DC-525	5HK-D5	
C89	.005	600	T16-326							
C90	.1	600	T16-238	P688-1	DF-104	PT6E1		PT601	6TM-P1	
C91	.1	400	T16-187	P488-1	DF-104	PT6E1		PT401	4TM-P1	
C92	.033	600	T16-234	P688-033		PT6E33		PT633		
C93	.0047	600	T16-233	1464-005		LDR5D5		MCB465	MS-35	
C94	.1	500	T16-238	P688-1	DF-104	PT6E1		PT601	6TM-P1	
C95	1000		T15-330	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C96	1000		T15-330	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C97	.01	600	T16-327	P688-01	D6-103	PT6E81	GP2-333-103	PT611	6TM-S1	
C98	.0047	600	T16-233	1464-005		LDR5D5		MCB465	MS-35	
C99	.047	600	T16-335	P688-047	DF-503	PT6S47		PT647	6TM-S47	
C100	3900	500		1464-004		LDR5D4		MCB463	MS-34	
C101	.22	600	T16-318	684-25		PT6EP25		PT6025	6TM-P25	
C102	330	500	T15-326							
C103	390	500	T15-331	1469-0004		5R574		MCB343	MS-34	
C104	110		T15-332	BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5CA-T12	
C105	.1	600	T16-238	P688-1	DF-104	PT6E1		PT601	6TM-P1	
C106	.1	1000	T16-321	P1088-1		PT6E1P1		PT1601	MB-P1	
C107	.047	1000	T16-335	P1088-05		PT6S65		PT1615	MB-S5	
C108	500	20000	T15-329	HV30C	TV3-503	MMC-30T5	413-501	HV30035A	20DK-T5	
C109	56	2000							20GA-Q56	Note 4
C110	.01	600	T16-327	689ZX-01		PJ6S1		PT611	6TM-S1	
C111	.01	600	T16-327	689ZX-01		PJ6S1		PT611	6TM-S1	

Note 1. Ch. 528.261, 528.263-1, 528.264-1, 528.264 -2, 528.266 use .47MFD in this application.
Note 2. Ch. 528.261, 528.264, 528.266 use .01MFD in this application.
Note 3. Used in Ch. 528.261,528.266, 528.266-1 and 528.286
Note 4. Some Models use 50MMF in this application.
♦ Items C86A, C86B, C86C, R71A, R71B, R71C are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	½	24-206	*QJ-482	RTV-282		UF15L	Contrast- Panel
B	500KΩ	½	Not Req.				UR55A †	Volume - Rear
C	Switch		Not Req.				US-26	Attach to R1B
R2A	50KΩ	½	25-21	Q11-123	AG-44-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	1 Meg	½	25-22	Q11-137	AG-61-S	AB-62	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	50KΩ	½	A25-21	Q11-123	AG-44-S	AB-31	U-35	Brightness
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5A	2 Meg	½	25-15	Q11-139	AG-83-S	AB-75	SU-56	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	2500Ω	½	25-13	Q11-12	AG-15-S	AB-7	SU-8	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	2250Ω	2	A25-14	WK-2500	A43-2500	VK-132	R2500L	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R7A
R8	900KΩ	½	25-23					Tone and switch-Note

Note: Tone control used in chassis No. 528.261, 528.266, 528.286, 528.266-1, and 528.270.
♦ CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS AND SHAFTS B17-108, P1-200 (Panel)
B13-133 & R1-233 (Rear) and SWITCE 76-1.
† Universal replacement (Mallory exact duplicate Part No. US52B).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SILVERTONE PART No.	IRC PART No.	NOTES
R9	1500Ω	½		BTS-1500	
R10	1500Ω	½		BTS-1500	
R11	12KΩ	½		BTS-12K	
R12	150Ω	½		BTS-150	
R13	15KΩ	½		BTS-15K	
R14	47KΩ	½		BTS-47K	
R15	180KΩ	½		BTS-180K	
R16	100KΩ	½		BTS-100K	
R17	1500Ω	½		BTS-1500	
R18	10KΩ	½		BTS-10K	
R19	230KΩ	½		BTS-230K	
R20	10KΩ	½		BTS-10K	
R21	15KΩ	½		BTS-15K	
R22	3300Ω	2	T60-816	BTS-3300	
R23	220KΩ	½	T60-672	BTS-220K	
R24	1000Ω	½	T60-703	BTS-1000	
R25	3300Ω	½	T60-862	BTS-3300	
R26	1000Ω	½	T60-703	BTS-1000	
R27	56Ω	½	T60-806	BTS-56	
R28	16KΩ	½	T60-777	BTS-16K	
R29	1000Ω	½	T60-703	BTS-1000	
R30	1000Ω	½	T60-703	BTS-1000	
R31	56Ω	½	T60-806	BTS-56	
R32	1000Ω	½	T60-703	BTS-1000	
R33	680KΩ	½	T60-807	BTS-680K	
R34	15KΩ	½	T60-783	BTS-15K	
R35	150KΩ	½	T60-787	BTS-150	
R36	1000Ω	½	T60-703	BTS-1000	
R37	12KΩ	½	T60-811	BTS-12K	
R38	2.2Meg	½	T60-898	BTS-2.2Meg	
R39	470KΩ	½	T60-802	BTS-470K	
R40	33KΩ	½	T60-748	BTS-33K	
R41	220KΩ	½	T60-672	BTS-220K	
R42	47KΩ	½	T60-730	BTS-47K	
R43	3300Ω	2	T60-816	BTS-3300	
R44	680Ω	½	T60-708	BTS-680	
R45	33KΩ	½	T60-748	BTS-33K	
R46	3300Ω	1	T60-724	BTA-3300	
R47	2700Ω	1	T60-892	BTA-2700	
R48	100KΩ	½	T60-801	BTS-100K	
R49	100KΩ	½	T60-801	BTS-100K	
R50	1 Meg	1	T60-877	BTA-1 Meg	
R51	39KΩ	½	T60-893	BTS-39K	
R52	3300Ω	2	T60-816	BTS-3300	
R53	150Ω	½	T60-767	BTS-150	
R54	8200Ω	2	T60-878	BTS-8200	
R55	10KΩ	2	T60-900	BTS-10K	
R56	150Ω	½	T60-767	BTS-150	
R57	47KΩ	½	T60-730	BTS-47K	
R58	12KΩ	½	T60-811	BTS-12K	
R59	4.7Meg	½	T60-779	BTS-4.7Meg	

♦ Items R71A, R71B, R71C, C86A, C86B, are combined in one unit.
Note 1. Some models may use a 1 Meg resistor in this application.
Note 2. Used in chassis No. 528.286, 528.264-2, 528.266-1,528.263-1, 528.263-2, 528.261, 528.264-2, and 528.64l.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SILVERTONE PART No.	IRC PART No.	NOTES
R60	270KΩ	½	T60-747	BTS-270K	
R61	100KΩ	½	T60-801	BTS-100K	
R62	180K 5%	½	T60-788	BTS-180K 5%	
R63	330K 5%	½	T60-787	BTS-330K 5%	
R64	800Ω	5	T60-800	1 3/4-800	
R65	270KΩ	½	T60-747	BTS-270K	
R66	1.2Meg	½	T60-762	BTS-1.2Meg	
R67	22KΩ	½	T60-744	BTS-22K	
R68	2200Ω	½	T60-754	BTS-2200	
R69	3900Ω	½	T60-710	BTS-3900	
R70	3300Ω	½	T60-882	BTS-3300	
R71A	22KΩ	½		BTS-22K	
B	8200Ω	½	♦ T17-106	BTS-8200	
C	8200Ω	½		BTS-8200	
R73	1.2Meg	½	T60-762	BTS-1.2Meg	Note 1.
R73	1.5Meg	½	T60-763	BTS-1.5Meg	
R74	1.5Meg	½	T60-880	BTS-1.5Meg	
R75	220KΩ	½	T60-672	BTS-220K	
R76	8200Ω	½	T60-878	BTS-8200	
R77	2.2Meg	½	T60-898	BTS-2.2Meg	
R78	1800Ω	1	T60-899	BTA-1800	
R79	560Ω	½	T83-743	BTS-560	
R80	560Ω	½	T83-743	BTS-560	
R81	15KΩ	½	T60-783	BTS-15K	
R82	15KΩ	½	T60-783	BTS-15K	
R83	330Ω	2	T60-814	BTB-330	
R84	10K Ω	20	T60-897	3D 10K	
R85	15KΩ	½	T60-901	BTS-15K	
R86	100KΩ	½	T60-801	BTS-100K	
R87	100KΩ	½	T60-801	BTS-100K	
R88	4.7Meg	½	T60-779	BTS-4.7Meg	
R89	470KΩ	½	T60-731	BTS-470K	
R90	1500Ω	½	T60-729	BTS-1500	
R91	8200Ω	½	T60-778	BTS-8200	
R92	120KΩ	½	T60-817	BTS-120K	
R93	220KΩ	1	T60-886	BTA-220K	
R94	56K Ω	½	T60-802	BTS-56K	
R95	10KΩ	½	T60-760	BTS-10K	
R96	100Ω	½	T60-752	BTS-100	
R97	1 Meg	½	T60-866	BTS-1 Meg	
R98	100Ω	½	T60-752	BTS-100	
R99	15KΩ	5	T60-804	1 3/4A-15K	
R100	47Ω	1	T60-805		
R101	1000Ω	½		BTS-1000	
R102	3.3Ω	½	T60-884		
R103	220KΩ	½	T60-672	BTS-220K	
R104	8300Ω	½	T60-778	BTS-8200	Note 2
R105	100KΩ	½	T60-752	BTS-100K	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC @1.98A	780VCT .250ADC	5VAC @3A SEC. 4	6.3VAC @.99A SEC. 5	80-264	P-8169				
			6.3VAC @1.15A	6.3VAC @7.4A						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	170Ω	940Ω	T80-357 T80-284①	A-8126 ①	A-3003 ②	TBC-5 ③	A-97X③	209T1 ①	Vert.Osc. Trans.
T3	428Ω tap④	3.3Ω SEC. 2	T80-278					232T1 & 21SR1 ⑤	Horiz. Output Trans.
	.8Ω, 7.2Ω, 14.2Ω, 21.7Ω, 27.7Ω	0Ω							
T4	1126Ω tap ⑥		T80-277	A-8128	A-3037	TSC-8 ③	A-102X	222T1	Vert.Output Trans.
	11.6Ω								
T5A	18.4Ω		T83-743	DY-9A ④	MDF-72	TY-3 ⑤	Y-17	21UD2	Horiz.Deflection Coils
B	47Ω								Vert.Deflection Coils
T6	420Ω		T10-560	FC-11	MF-2	TC-2 ⑥			Focus Coil
T7	14.2Ω		T10-562		MWC-6	TW-7	WC-12⑦	213R1	Horiz.Linearity Coil
T8	.8Ω		T10-561		WC-1	TW-1		20H1	Width

① Alternate vertical oscillator transformer used in Ch. 528.261, 263-1, 264-1, 264-2, 266, 266-1, 286.
② Drill one new mounting hole.
③ Connect as auto transformer
④ Use original horizontal deflection coil network, if necessary.
⑤ Use original deflection coil network.
⑥ Fabricate new mounting bracket.
⑦ Connect to coded blue and green terminals.
⑧ See instruction sheet packed with unit for terminal connections.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T9	5.4KΩ	3.1Ω	260Ω	.44Ω	80-253	A-3849	A-3019	RO-9 ①	S-5X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	6"	PM	3.1Ω	T79-398 ①	6J4	6A1	① Used in Models 3150L, 4127, 4126 and 4128
B	8"	PM	3.1Ω	T79-397 ②	5J4	5A1	② Used in Models 3112B, 3109, 4116, 4117, 4111, 3110B, 4113, 4114, 4115, 4118 & 4119
C	8"	PM	3.1Ω	T31-126 ③	8J6	8A21	③ Used in Model 4131.
D	10"		3.1Ω	T79-396 ④	10J11	10A31	④ Used in Model 3170D, 4150D, 4153D, 4158D, 4140D, 4143D, 4145D, 3151C, 4139, 4139 & 4149
				T79-399 ⑤			⑤ Alternate 8" PM Speaker

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	UHF Ant. Coil	0Ω						
B	UHF Mixer Coil	0Ω						
C	UHF Osc. Coil	0Ω						
L2	UHF Ant. Coil end inductor	0Ω						
L3	UHF Mixer Coil End inductor	0Ω						
L4	UHF Osc. Coil end inductor	0Ω						
L5	FIL Choke	.1Ω						
L6	FIL Choke	.1Ω						
L7	Cathode Choke	0Ω						.38 Microbeary
L8	RF Choke	0Ω						.38 Microbeary
L9	UHF IF C coupling	0Ω						
L10	UHF IF Input Trans.	0Ω	0Ω					
L11	RF Choke	.1Ω						
L12	UHF IF Output Trans.	0Ω	0Ω					
L13	Ant. Coils	0ΩCT	0Ω					
L14	FIL. Choke	0Ω						
L15	Neutr. Coil	0Ω						
L16	RF, Mixer grid & Osc. Coils	0Ω						
L17	FIL Choke	0Ω						
L18	RF Choke	0Ω						
L19	1st Video IF	.9Ω						
L20	RF Choke	1.2Ω						
L21	2nd Video IF	.3Ω	.2Ω	T10-541	17-1062		6250	
L22	3rd Video IF	.3Ω	.2Ω	T10-543	17-1063		6249	
L23	FIL. Choke	.4Ω		T23-236	19-3001	TV-189	4602	1 Microbeary; IRC Part # CL-1 Includes trap
L24	4th Video IF	.8Ω	.6Ω	T10-588				
L25	Series Peak. Coil	.9Ω		T33-236			4624	14 Microberies; Note 1
L26	Series Peak. Coil	6.5Ω		T10-557	A-3093	TV-181	6177	90 Microberies; Note 3
L27	Shunt. Peak. Coil	13Ω		T10-579	19-3500	TV-188	6174	550 Microberies; Note 3
L28	Series Peak. Coil	6.5Ω		T10-580 *	19-3180 *	TV-184 *	6180 *	175 Microberies; Wound on 8.2KΩ resistor. Note 4.
L29	4.5MC Trap	1.6Ω		T10-581 *	20-1004	TV-151	1689	
L30	Shunt. Peak. Coil	11Ω		T10-578	19-4412		4646 †	410 Microberies; Wound on 10KΩ resistor. Note 5
L31	Sound IF	2.7Ω		T10-587	20-1005	TV-161	1469	
L32	Ratio Det.	2.8Ω		T10-552	17-1033 ■	TV-120 ■	1468 ■	Tertiary winding- 9Ω
L33	Horiz. Osc.	55Ω		T10-583	19-1576	TV-163	6210	Silvertone Part # includes C100

Note 1. Chassis 528.263-2, 528.26 4-2, 528.266-1, 528.286, 528.270 use 20 Microhenries series peaking coil in this application.
Note 2. Chassis 528.263-2, 528.26 4-2, 528.266-1, 528.286, 528.270 use 120 Microhenries series peaking coil wound on 10KΩ resistor in this application.
Note 3. Chassis 528.263-2, 528.26 4-2, 528.266-1, 528.286, 528.270 use 220 Microhenries shunt peak. coil in this application .
Note 4. Chassis 528.263-2, 528.264 -2, 528.266-1, 528.286, 528.270 use 262 Microhenries series peak. coil wound on 10KΩ resistor in this application.
Note 5. Chassis 528.263-2, 528.264 -2, 528.266-1, 528.286, 528.270 use 463 Microhenries shunt peak. coil sound on 10KΩ resistor in this application.
* Parallel with 8.2KΩ resistor.
† Parallel with 10KΩ resistor.
■ Drill mounting holes.

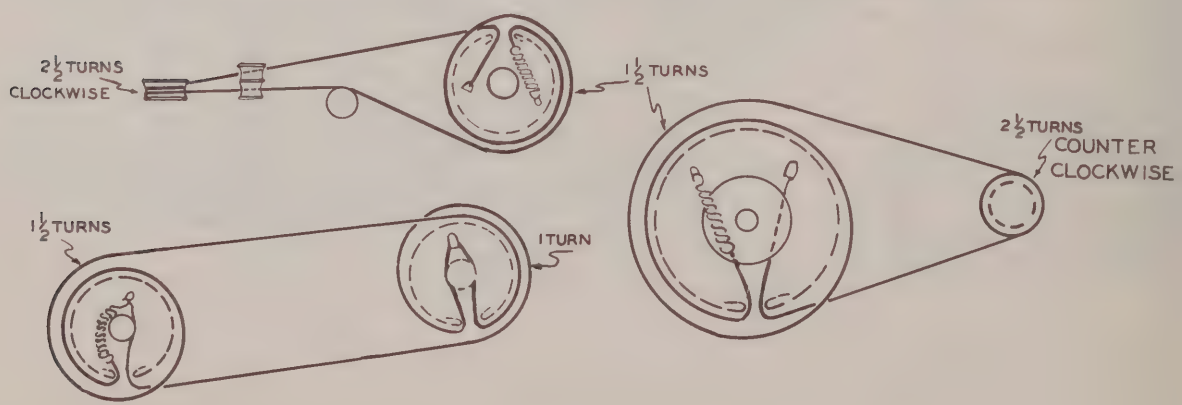
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA SILVERTONE PART No. FUSE	SILVERTONE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1A	T43-15	T87-44	312001 (3AG-1A)	341001	AGC 1	HKP
M2	3AG P/T	1/4A	T43-13		318.250 (3AG P/T - 1/4A)		GJV 1/4	

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Dial Light	T89-7	#47
M4	Tuner	T95-13	VHF
M5	Ion Trap	T83-684	
M6	Tuner	T95-32	UHF Converter (Not used in all Models)
M7	Switch	T84-784	UHF-VHF Selector (Rotary -mounts on rear of VHF tuner)
M8	Switch		TV-phono (Not used in all Models)
B2	Trimmer Cap.	T20-145	Horiz. Drive
	Cabinet	T42-567	Leatherette-Model 3112B
	Cabinet	T42-568	Mahogany-Model 3151B
	Cabinet	T42-569	Wood console-Model 3150L
	Cabinet	T42-570	Mahogany-Model 3170D
	Cabinet	T42-575	Mahogany - Models 4140D, 4139
	Cabinet	T42-577	Mahogany - Models 4149, 4150D
	Cabinet	T42-578	Maple - Model 4155D
	Cabinet	T42-579	Maple - Model 4145D
	Cabinet	T42-584	Limed oak - Model 4143D
	Cabinet	T42-585	Limed oak - Model 4153D
	Cabinet	T42-589	Leatherette - Model 3109
	Cabinet	T42-591	Leatherette - Model 4127
	Cabinet	T42-593	Leatherette - Model 4126
	Cabinet	T42-594	Leatherette - Model 3110B
	Cabinet	T42-595	Leatherette - Model 4113
	Cabinet	T42-596	Leatherette - Model 4111
	Cabinet	T42-598	Blonde - Model 4117
	Cabinet	T42-599	Mahogany - Model 4116
	Cabinet	T42-601	Mahogany - Model 4131 and 3151C
	Cabinet	T42-605	Marlite - Model 4114
	Cabinet	T42-606	Marlite-Mahogany- Model 4118
	Cabinet	T42-629	Marlite - Model 4128
	Cabinet	T42-631	Marlite-Blonde - Model 4119
	Cabinet	T42-628	Marlite-Mahogany - Model 4129
	Knob	T52-351	Channel selector - Model 3109, 3110B
	Knob	T52-395	Channel Selector - Model 4111, 4114, 3170D
	Knob	T52-399	Channel selector - Model 3150L, 4126
	Knob	T52-403	Channel selector - Models 4116, 4140D, 4145D, 4150D, 4155D, 3151C, 4113, 4118, 4131
	Knob	T52-416	Channel selector - Model 3112B, 3151B, 4127
	Knob	T52-420	Channel selector - Model 4117, 4143D, 4153D
	Knob	T52-431	Channel selector - Model 4119
	Knob	T52-429	Channel selector - Models 4128, 4129
	Knob	T52-426	Channel selector- Models 4115, 4139, 4149
	Knob	T52-412	UHF tuning - Model 4116, 4117, 4143D, 4153D, 4119
	Knob	T52-419	UHF tuning - Models 4140D, 4145D, 4150D, 4155D, 3112B, 3151B, 3151C, 4113, 4118, 4127, 4129, 4131, 4115, 4139, 4149
	Knob	T52-354	Contrast - Model 3109, 3110B
	Knob	T52-397	Contrast - Model 3170D
	Knob	T52-402	Contrast - Model 3150L, 4111, 4114, 4126
	Knob	T52-404	Contrast - Model 4116, 4117, 4143D, 4153D, 4119
	Knob	T52-417	Contrast - Models 4140D, 4145D, 4150D, 4155D, 3112B, 3151B, 5151C, 4113, 4118, 4127, 4128, 4129, 4131, 4115, 4139, 4149
	Knob	T52-353	Off/On/Volume - Models 3109, 3110B
	Knob	T52-398	Off/On/Volume - Model 4111, 4114, 3170D
	Knob	T52-401	Off/On/Volume - Models 3150L, 4126
	Knob	T52-405	Off/On/Volume - Models 4116, 4140D, 4145D, 4150D, 4155D, 3151C, 4113, 4118, 4131, 4115, 4139, 4149
	Knob	T52-418	Off/On/Volume - Model 3112B, 3151B, 4127, 4128, 4129
	Knob	T52-430	Off/On/Volume - Model 4119
	Knob	T52-421	Off/On/Volume - Models 4117, 4143D, 4153D
	Knob	T52-352	Fine tuning - Models 3109, 3110B
	Knob	T52-396	Fine tuning - Model 3170D
	Knob	T52-400	Fine tuning - Models 3150L, 4111, 4114, 4126
	Knob	T52-409	Fine tuning - Model 4116
	Knob	T52-419	Fine tuning - Model 4128
	Knob	T52-422	Fine tuning - Model 4117
	Knob	T52-390	TV-Phono - Models 4116, 4117, 4140D, 4143D, 4145D, 4150D, 4150D, 4153D, 4155D, 3170D
	Safety Glass	T48-63	Models 3170D
	Safety Glass	T48-66	Models 3151B, 3150L, 3109
	Safety Glass	T48-67	Models 3112B, 4113, 4127, 3110B, 4111, 4126, 4113, 4114, 4118, 4127, 4128, 4119, 4129
	Safety Glass	T48-68	Models 4150D, 4153D, 4155D, 4140D, 4143D, 4145D, 4139, 4149
	Safety Glass	T48-72	Models 4131, 3151C, 4116, 4117, 4115



UHF DRIVE CORD STRINGING

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, check fuse M1, V22 and B+ filter and decoupling circuit components.

SMALL AND/OR DIM PIX

Substitute V22. Check B+ filter and decoupling components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M2. Check by substitution V18, V19, V20 and V21. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check C108, R102, R50, T3, T5A and other associated components.	Check R93, R94, R97, C102, C103 C104, and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V18, V19, V20, V21 and V22. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V21, V20, V19, V18 and V22. Check T3, T5A, C108, R102, R50 and other associated components. Check picture tube.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V3, V4, V5, V6, V7, V8 and V9. Check associated circuit components. In case of UHF, check V1 and V2.

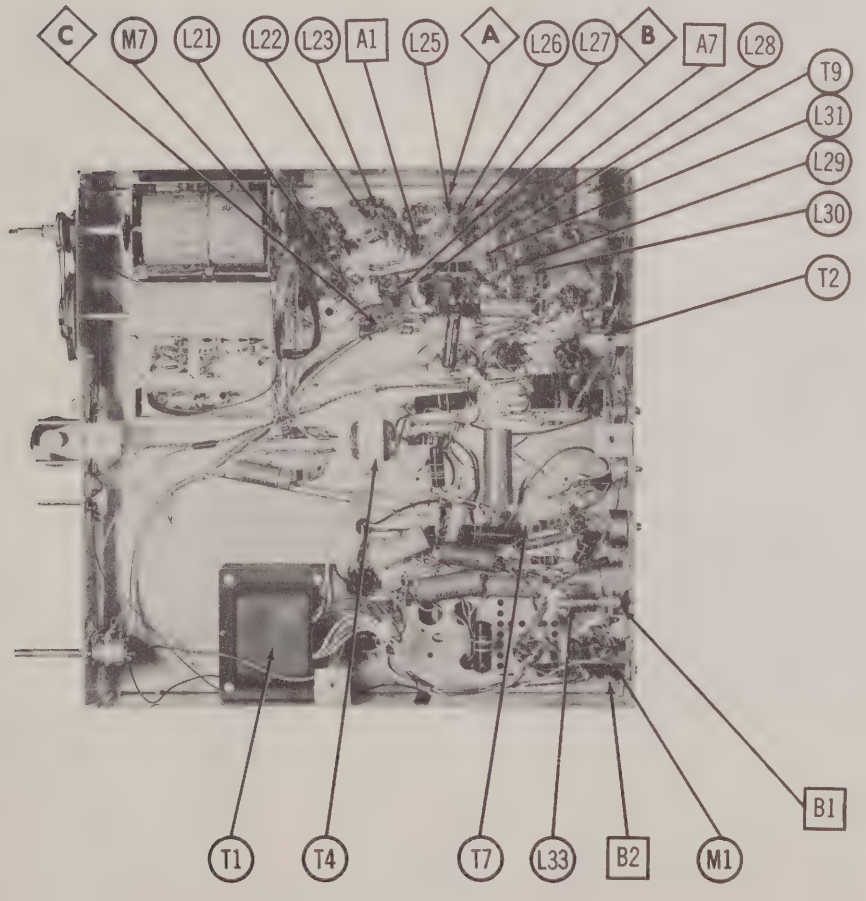
NO RASTER NO SOUND

See "Dead Set".

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing. Check video at W1 for interference pulses.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

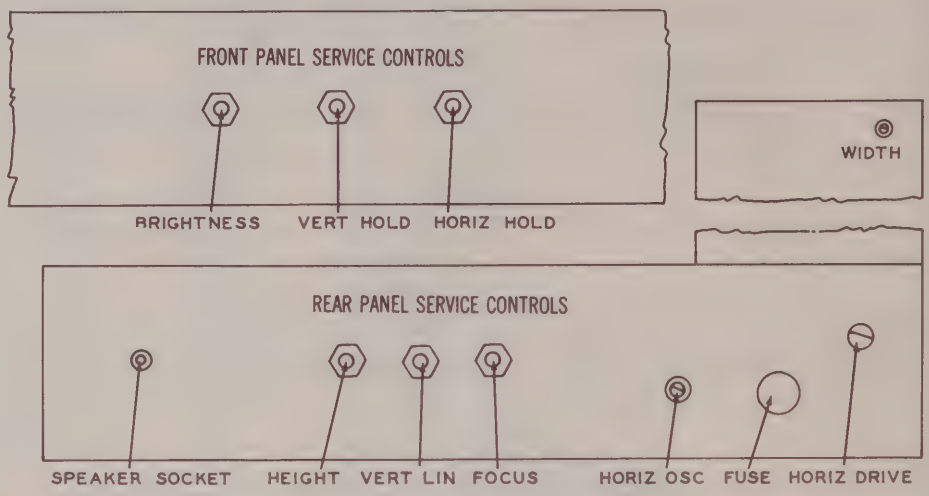
PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws holding wood strip at top of safety glass. Remove wood strip and safety glass.

PICTURE TUBE REMOVAL

For picture tube safety glass cleaning , it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal oscillator slug (L33) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L32) located on top of chassis. (See tube placement chart).

FUSES

Two fuses are used. One for horizontal sweep circuit protection and one for LV power supply protection. (For location see tube placement chart).

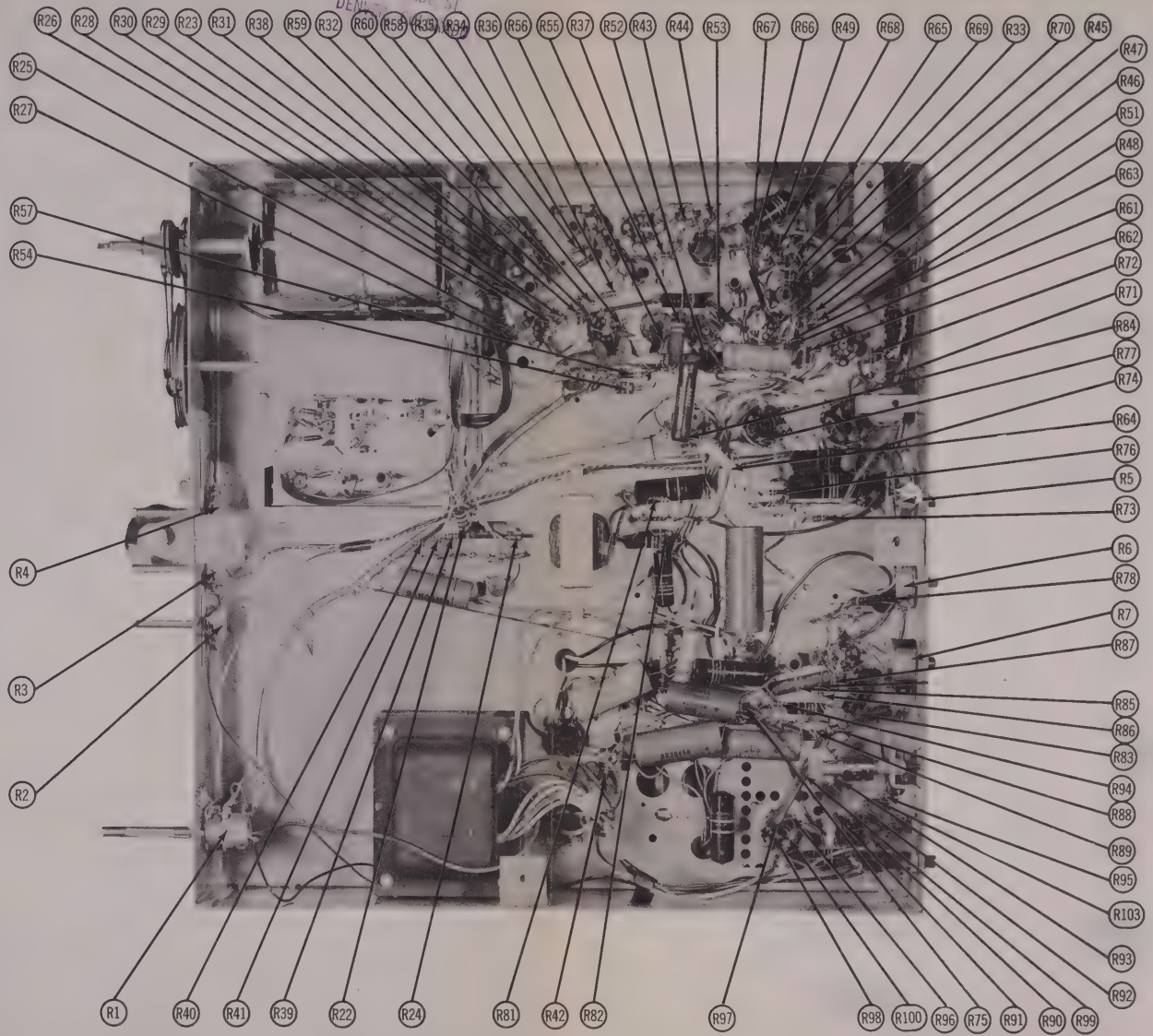
CENTERING

Centering is accomplished mechanically by positioning the focus coil. Adjust the three wing nuts located on the focus coil mounting bracket until picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push on type control knobs from front panel.
2. Disconnect built-in UHF antenna mounted on rear cover.
3. Loosen 7 wood screws. Push rear cover up and remove.
4. Disconnect VHF built-in antenna. Remove 4 wood screws. Remove VHF & UHF antenna brackets.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 speaker bolts. Remove speaker.

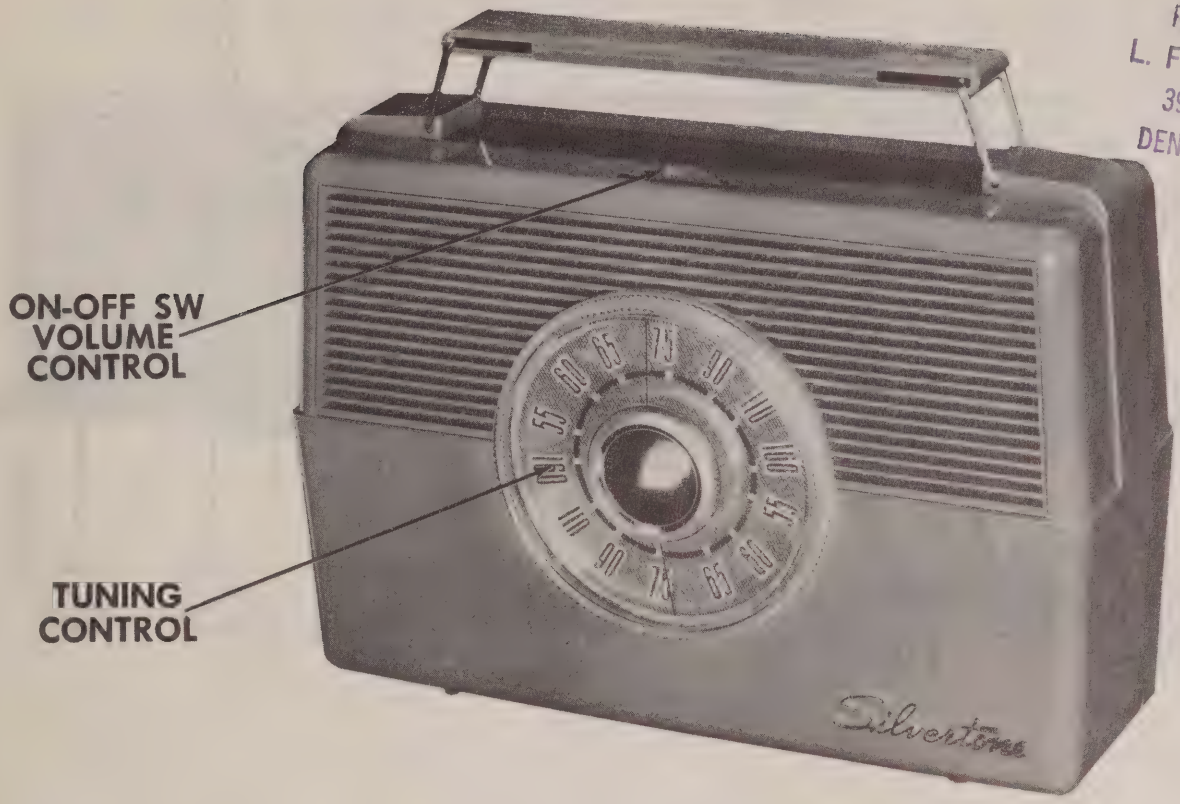
L. S. LANKENSHIP
3924 MEADE ST.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. E
3924
DENVER, COLORADO

SILVERTONE
MODEL 3217 (Ch. 528.265)



SILVERTONE
MODEL 3217 (Ch. 528.265)

TRADE NAME	Silvertone Models 3217 (Ch. 528.265)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	105-120 Volts AC-DC (or) 3 Volts "A" Supply & 67.5 Volts "B" Supply
RATING	.15 Amp. @ 117 Volts AC (or) 150MA @ 3 Volts DC & 10MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	535-1625KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdrive for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1625KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output.
4.		"	600KC	Tune to 600KC signal	"	A7	Rock tuning gang thru 600KC signal while adjusting for maximum deflection.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

SILVERTONE
MODEL 3217 (Ch. 528.265)

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■ 50	150	T18-307	AFH3-78		CO57		FP309	TVL-3427	
B	▲30	150								
C	100	10								
C2	.05	200	T16-197	P288-05	DF-503	PTE485		PT415	2TM-S5	
C3	.2	200	T16-242	P288-2		PTE4P2		PT402	2TM-P2	
C4	5000		T16-177	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C5A	150			SI150		TM5T15	GP2K-151	UC-5315	5GA-T15	
B	2000			BPD-002		TM5D2	801-002	DC-522	5HK-D2	
C	10000		T17-105	BPD-01	PC-165	TM5S1	811-01	DC-511	5HK-S1	Note 2
D	150			SI150		TM5T15	GP2K-151	UC-5315	5GA-T15	
E	5000			BPD-005		TM5D5	811-005	DC-525	5HK-D5	
C6	2000		T15-241	BPD-002	D6-202	TM5D2	801-002	DC-522	5HK-D2	
C7	20000		T15-240		DD-203				5HK-S2	
C8	20000		T15-240		DD-203				5HK-S2	

Note 1. Some Models may use a 50-30-200 @ 150-25.
Note 2. Items C5A, C5B, C5C, C5D, C5E, R9A, R9B, R9C and R9D are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	A24-204	Q13-137	AG-63-Z	B-70-S	U-53	Volume - Note
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

Note Some models may use alternate control part No. T24-204.

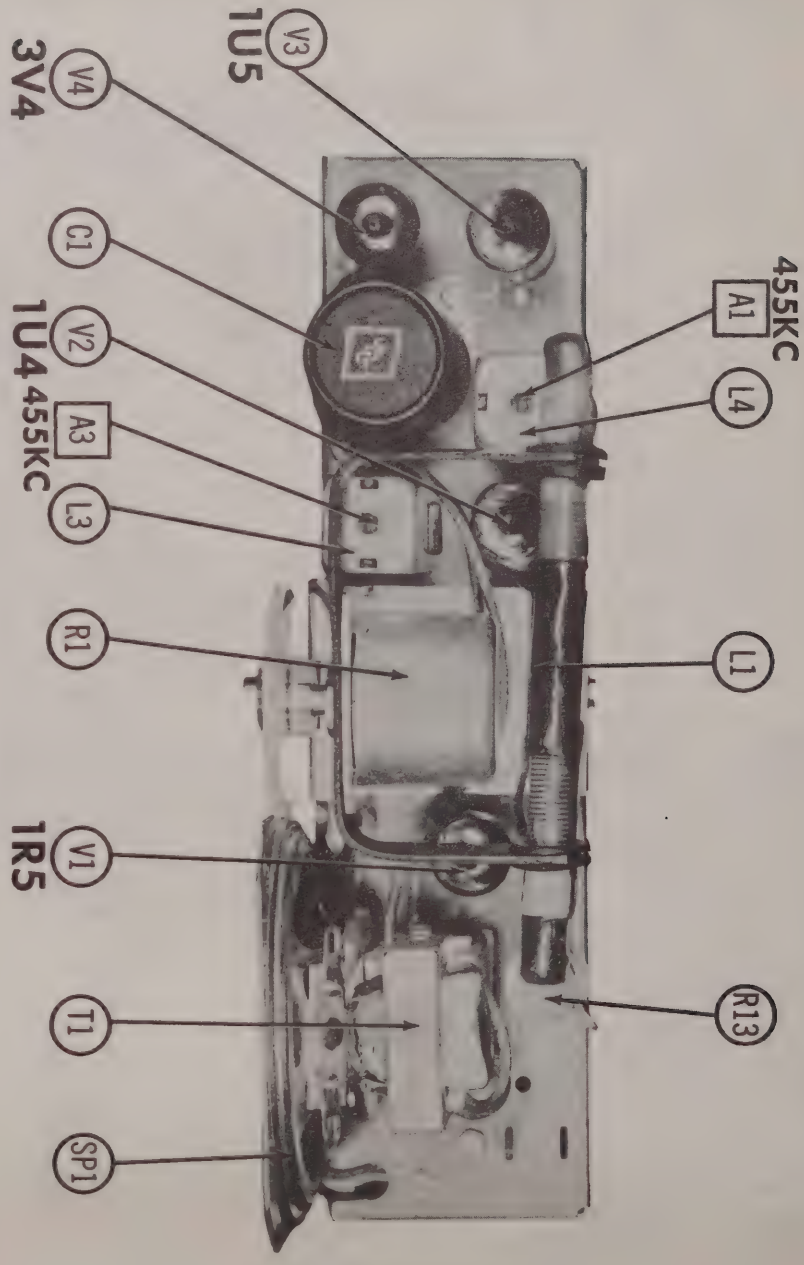
RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: Silvertone PART No.	IRC PART No.	NOTES
R2	100KΩ	½	T60-727	BTS-100K	
R3	10Meg	½	T60-728	BTS-10Meg	
R4	47KΩ	½	T60-730	BTS-47K	
R5	27Ω	½	T60-690	BTS-27	
R6	2. 2Meg	½	T60-726	BTS-2. 2Meg	
R7	470Ω	½	T60-770	BTS-470	
R8	1500Ω	½	T60-729	BTS-1500	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: SILVERTONE♦ PART No.	IRC PART No.	NOTES
R9A	10Meg	½	♦ T17-105	BTS-10Meg	
B	4. 7Meg	½		BTS-4. 7Meg	
C	1 Meg	½		BTS-1 Meg	
D	3. 3Meg	½		BTS-3. 3Meg	
R10	1500Ω	½	T60-729	BTS-1500	
R11	270Ω	½	T60-771	BTS-270	
R12	2200Ω	½	T60-714	BTS-2200	
R13	20000Ω	10	T60-885	1 3/4-2000	
R14	160Ω	3	T60-725		

♦ Items R9A, R9B, R9C, R9D, C5A, C5B, C5C, C5D, C5E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		Silvertone PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	9.2KΩ	3.1Ω	418Ω	.68Ω	T80-280	A-3329 ①	A-2900 ①	RO-16 ①	S-11X ①	① Bend mounting tabs down, file out slots mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Silvertone PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.1Ω	T79-413	35J4	3A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.6Ω		T92-79				
L2	Osc. Coil	1.9Ω	10Ω	T10-585			69-Osc.	
L3	Input IF	19Ω	19Ω	T10-508	16-6758	BC-352	12-C1	
L4	Output IF	19Ω	19Ω	T10-508	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				
	CURRENT	SILVERTONE PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.056A	T83-642	8J1	1002A	6S65	65

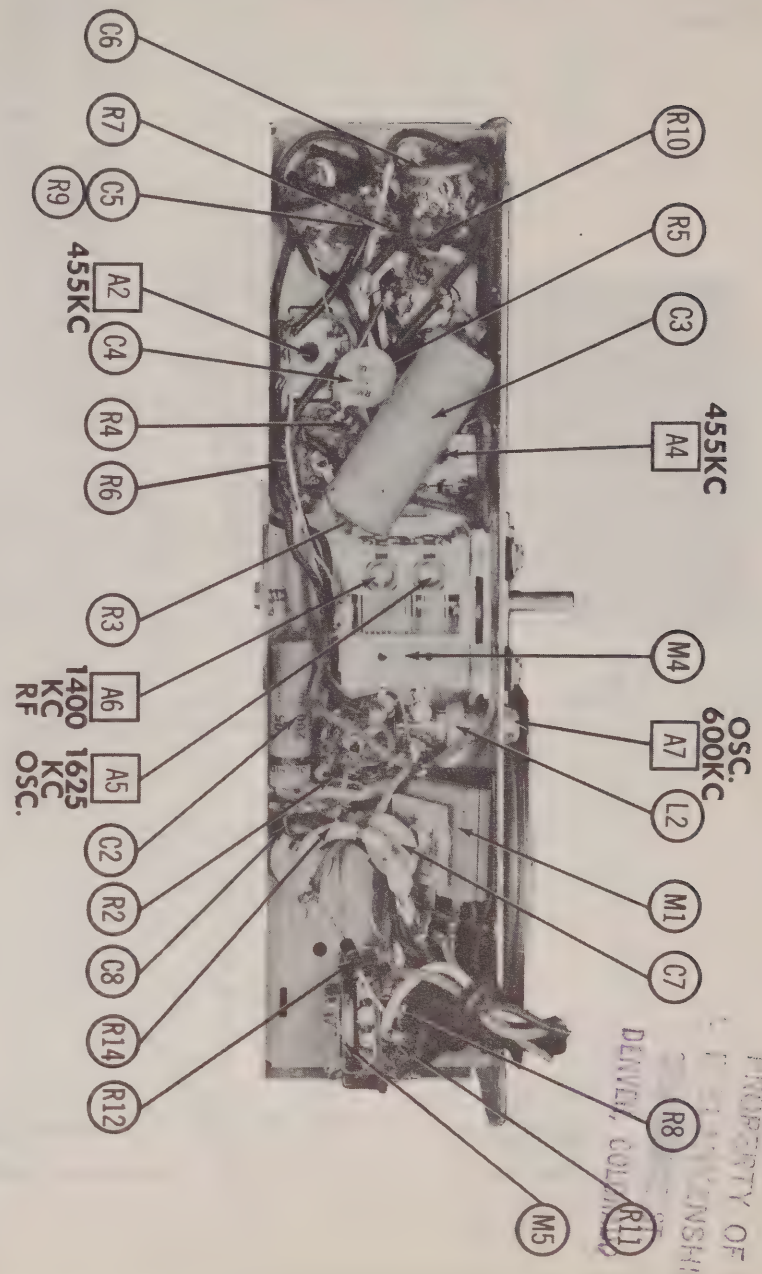
BATTERIES

ITEM No.	VOLTAGE	SILVERTONE PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1 1/2 V	6442	964			2IR			2 used in series.
M3	67.5V	6482		477			P45		

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Tuning cap	T19-230	2 gang (25-240MMF, 12-90MMF)
M5	Switch	T69-187	Power selector
	Cabinet	T42-543	Maroon-model 3215
	Cabinet	T42-544	Green-model 3216
	Cabinet	T42-545	Grey-model 3217
	Back cover	T42-573	Maroon-model 3215
	Back cover	T42-574	Green-model 3216
	Back cover	T42-572	Grey-model 3217
	Control disc	T52-391	On-off volume
	Dial scale	T67-574	Overlay
	Handle	T53-15	Maroon
	Handle	T53-17	Green
	Handle	T53-16	Grey
	Knob	T52-423	Tuning

CHASSIS—BOTTOM VIEW



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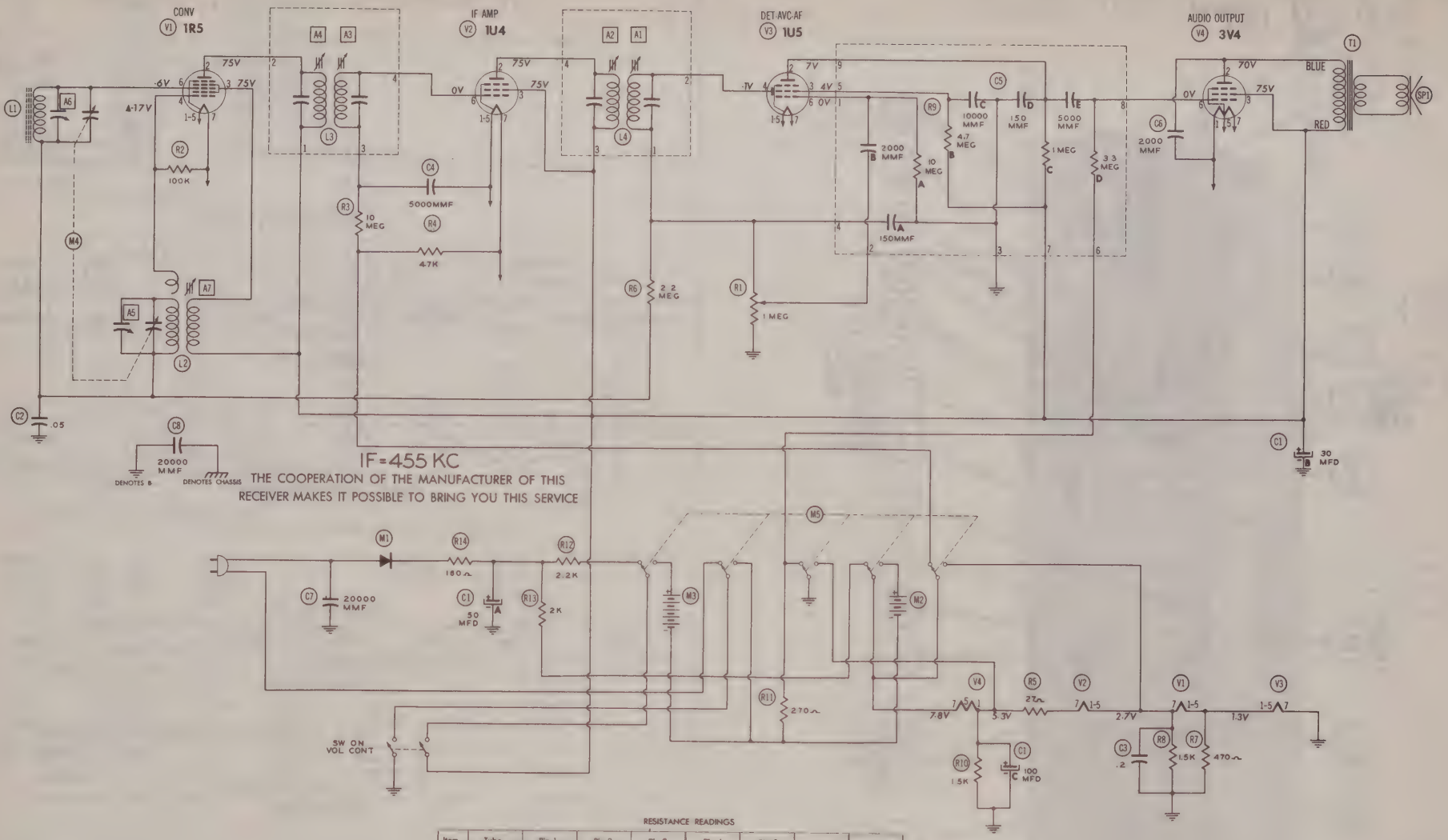
DENVER, COLORADO

SILVERTONE
MODEL 3217 (Ch. 528.265)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2.4KΩ	†2.4KΩ	100KΩ	*	3.2Meg	*
V 2	1U4	*	†2.4KΩ	†2.4KΩ	1.5KΩ	*	10Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	*	10Meg	*
V 4	3V4	*	†2.8KΩ	†2.4KΩ	*	*	3.3Meg	*

▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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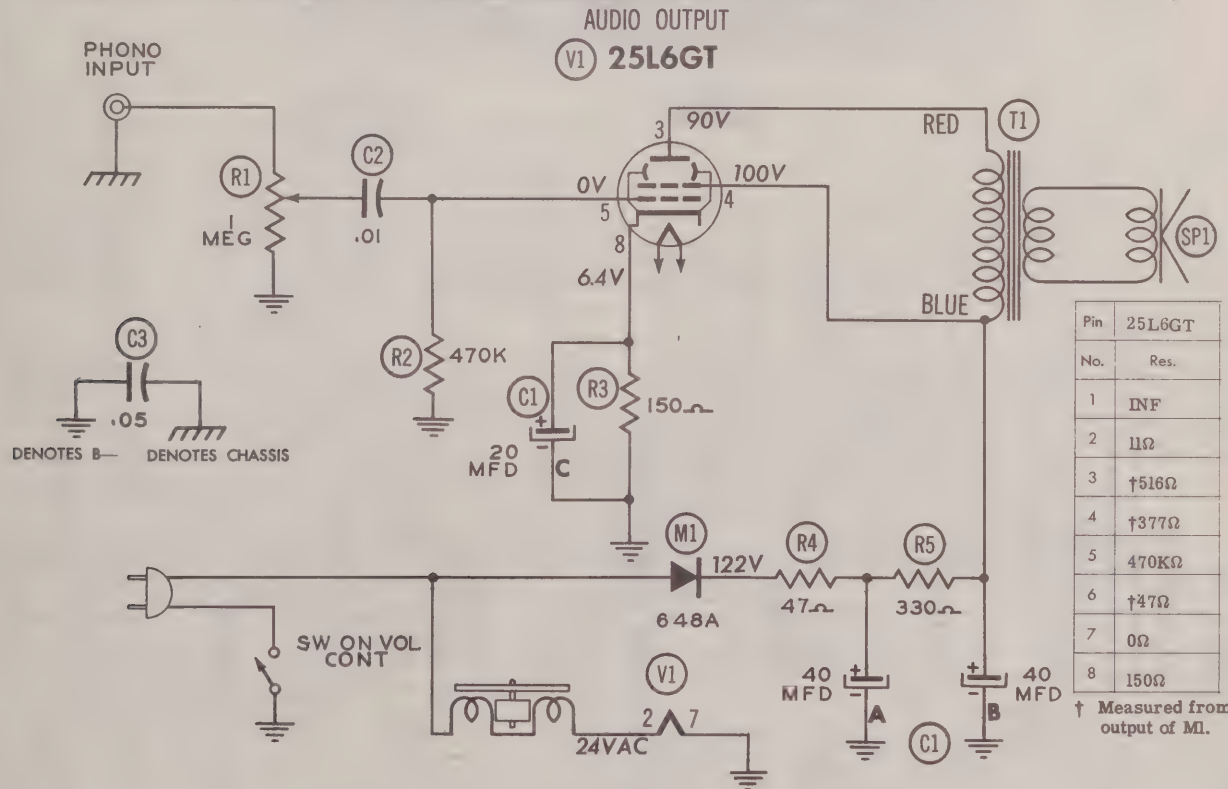
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	Steelman Model 351
MANUFACTURER	Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mt Vernon, N.Y.
TYPE SET	AC Operated Phono Amplifier with 3 Speed Manual Record Player
TUBES (One)	Type 25L6GT Audio Amplifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .35 Amp. @ 117 Volts AC



Pin No.	25L6GT Res.
1	INF
2	11Ω
3	†516Ω
4	†377Ω
5	470KΩ
6	†47Ω
7	0Ω
8	150Ω

† Measured from output of M1.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Audio Output	25L6GT	25L6GT	7S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS150/50-30-20		EDL44215		3N532	TVA-3448	Red
B	40	150								Blue
C	20	150								Yellow
C2	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C3	.05	400		P488-05		PTE4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	STEELMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	VC-42	Q13-137	AG-63-Z	B8K-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	STEELMAN PART No.	IRC PART No.	NOTES
R2	470KΩ	½		BTS-470K	
R3	150Ω	1		BTA-150	
R4	47Ω	1		BTA-330	
R5	330Ω	1			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	STEELMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2.8KΩ	3.4Ω	139Ω	.42Ω		A-3332①	A-3025 ①	RO-302 ①	S-1X ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	STEELMAN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3.4Ω		ST-113 Mod. P4-X	4A07	

SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	STEELMAN PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.048ADC		8 J1	1002A	6S65	65

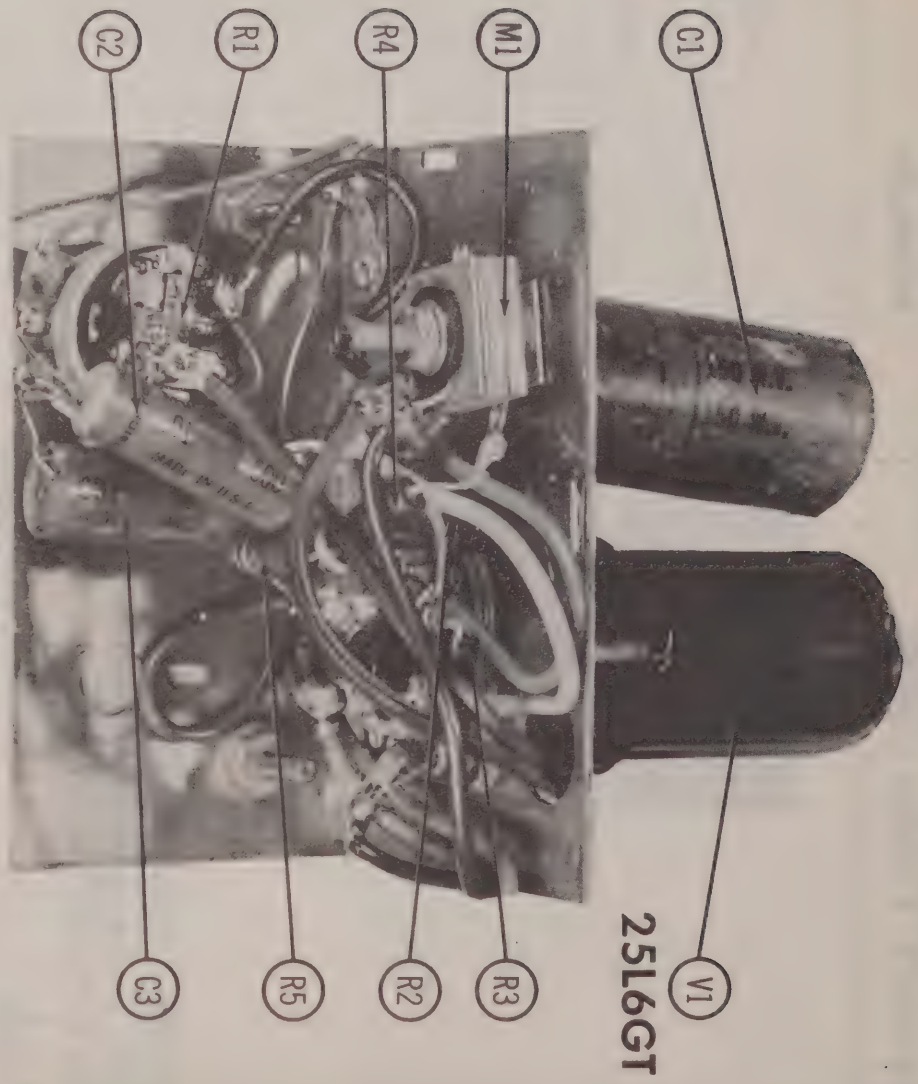
PHONO CARTRIDGE

ITEM No.	STEELMAN PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M2						*25H60		*Complete arm & cart. assy.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	STEELMAN PART No.	WALCO PART No.	JENSEN PART No.	REMARKS
M3		W-14AGA	W-422 or J-752	

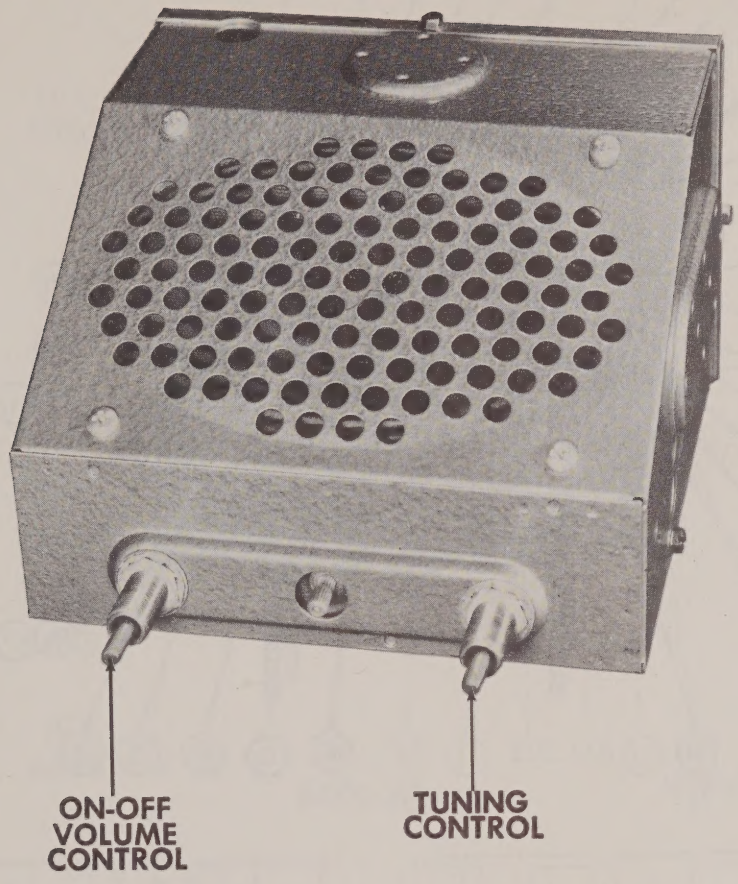


RETMA MEMBER

TRUETONE MODEL D4320

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRUETONE
MODEL D4320



TRUETONE
MODEL D4320

TRADE NAME	Truetone Model D4320
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Battery Operated Automobile Superheterodyne Receiver for Universal or Custom Installation
TUBES (Five)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6AS5 Audio Output
POWER SUPPLY	6 Volt Storage Battery — RATING 4.8 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Tuner core adjustment is not necessary since the cores are adjusted and sealed at the factory. The tuner assembly is a complete unit and in case of an individual part breakdown the entire tuner assembly should be replaced.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400∿Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	"	1620KC	"	"	A5	"
3.	50MMF	High side to antenna receptacle. Low side to chassis.	1300KC	Tune to 1300KC signal	"	A6, A7	"

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PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D4320

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7BK	
V4	Det-AVC-AF-Amp.	6AV6	6AV6	7BT	
V5	Audio Output	6AS5	6AS5	7CV	

CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■20	200	8C-21726	AFH3-119					R1430	
B	▲20	200								
C	40	25								
C2	.047	200	8D-21823	P288-047	DF-503	PJ2S5		PT4147	2TM-S47	
C3	90		8F-21949							
C4	.0047	200	8D-21819	P685-0047	D6-502	PJ6D5	GP2-333-502	PT6247	6TM-D47	
C5	10		8G-19502	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C6	47		8G-12198	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C7A	100		*201-15005	*PA-97	*PC-50		*1403-01		*100C1	
B	100									
C8	.01	200	8D-21820	P488-01	D6-103	PJ4S1	GP2-333-103	PT411	4TM-S1	
C9	.0047	200	8D-21819	P685-0047	D6-502	PJ6D5	GP2-333-502	PT6247	6TM-D47	
C10A	♦		♦17A-12742	♦PA-112-1	♦PC-70		♦1406-01		♦104C4	
B	5000									
C	♦									
C11	.01	400	8D-21828	P488-01	D6-103	PJ4S1	GP2-333-103	PT411	4TM-S1	
C12	.01	1000	8D-21836	BCD-27		PTE16S1		VB471	MB-S1	
C13	.047	400	8D-21831	P488-047		PJ4S5		PT4147	4TM-S47	
C14	.5	100	8D-19810	P288-5		MD2P5		RF480	2TM-P5	
C15	220	500	8F1-233		D6-221		GP2K-221		5GA-T22	
C16	1000		8G-20878	EF-001					503C-D1	
C17	.5	100	8D-19810	P288-5		MD2P5		RF480	2TM-P5	

* Items C7A, C7B and R8A are combined in one unit.
♦ Items C10A, C10B, C10C, R11A and R11B are combined in one unit.
When replacing items C10A, C10B and C10C separately, items C10A and C10C should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	10A-21722		AK-81	B-60-S	UT-429	Volume
B	Shaft		Not Req.		RS-3/16	AK-8	DS-37	Attach to R1A
C	Switch		Not Req.		SWA	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	NOTES
R2	1Meg	½	9B1-98	BTS-1Meg	
R3	220Ω	½	9B1-54	BTS-220	
R4	1MegΩ	½	9B1-98	BTS-1Meg	
R5	47KΩ	½	9B1-82	BTS-47K	
R6	2.2Meg	½	9B1-102	BTS-2.2Meg	
R7	220Ω	½	9B1-54	BTS-220	
R8	47KΩ	½	* 201-15005	BTS-47K	
R9	22KΩ	½	9B1-78	BTS-22K	

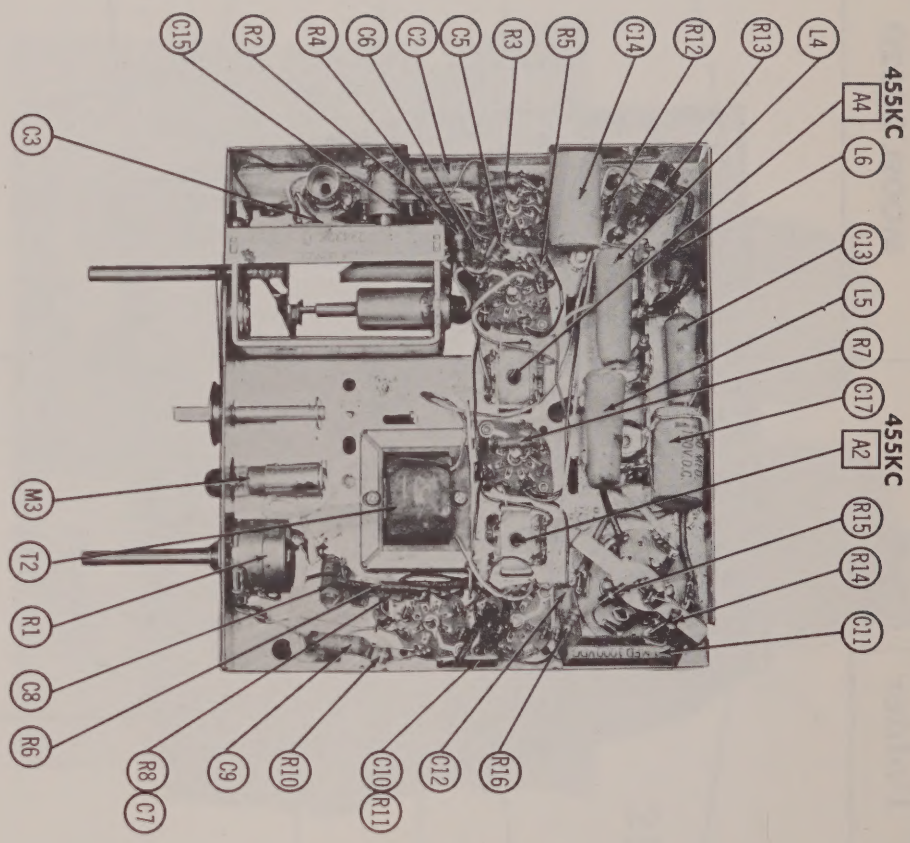
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	NOTES
R10	6.8Meg	½	9B1-108	BTS-6.8Meg	
R11A	470KΩ	½	♦ 17A-21742	BTS-470K	
B	470KΩ	½		BTS-470K	
R12	220Ω	½	9B1-54	BTS-1200	
R13	1200Ω	2	9B4-63	BTB-1200	
R14	68Ω	½	9B1-48	BTS-68	
R15	68Ω	½	9B1-48	BTS-68	
R16	3300 Ω	½	9B1-68	BTS-3300	

* Items R8A, C7A, C7B, are combined in one unit.
♦ Items R11A, R11B, C10A, C10B, C10C are combined in one unit.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC 2.3A	310VCT .061ADC			12A21729				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	4.6KΩ	3.3Ω	300Ω	.45Ω	12C21731					

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	VIKING PART No.	QUAM PART No.	
SP1	4 x 6"	PM	3.3Ω	18A22125	46J6	46A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1A	Ant. Coil	.8Ω						Part of tuning assembly, tuner Part # 13F-21922
B	RF Coil	12Ω						Part of tuning assembly, tuner Part # 13F-21922
C	Osc. Coil	.5Ω	5.5Ω					Part of tuning assembly, tuner Part #13F-21922
L2	Input IF	15Ω	15Ω	13B-17731	16-6758	BC-352	12-C1	
L3	Output IF	15Ω	15Ω	13B-17731	16-6758	BC-353	12-C2	
L4	Fil. Choke	0Ω		16M-19921			5221	2.5Microhenries
L5	Vibrator Hash Choke	0Ω		16M-19921			5221	2.5Microhenries
L6	RF Filter Choke	12Ω		201-16379			4650	640Microhenries

VIBRATOR

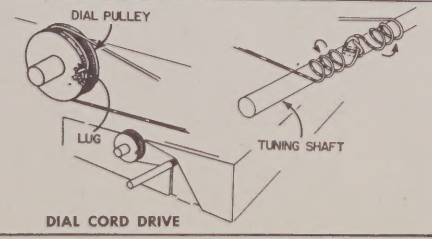
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				TRUETONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Synchronous	6.3V	115∿	12A21732	5454	742	5454	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TRUETONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	46B-17993		307014 (SFE-14A)	155014	SFE-14	HD1

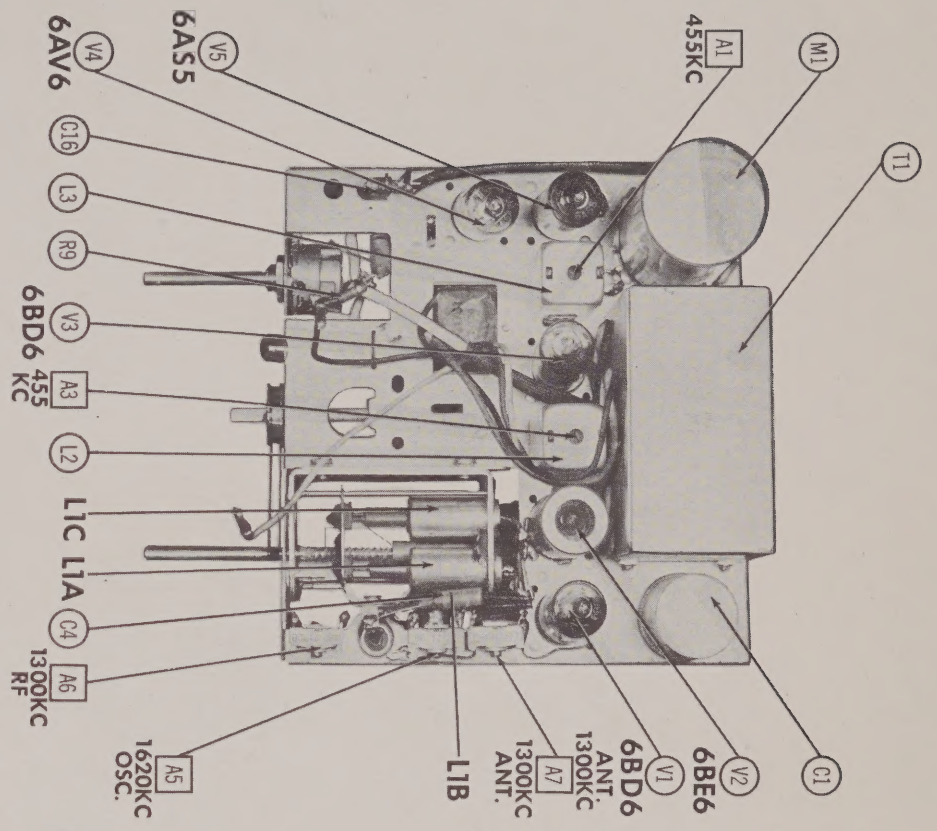
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Dial Light	46A-11739	#44
A5, A6 A7	Trimmer Cap.	8E-21728	3 Used
	Knob	4B-21985	2 Used
	Chassis Case	2B-21738	
	Rear Cover	2B-21737	
	Dial Scale	5M-21796	Glass



DIAL CORD DRIVE

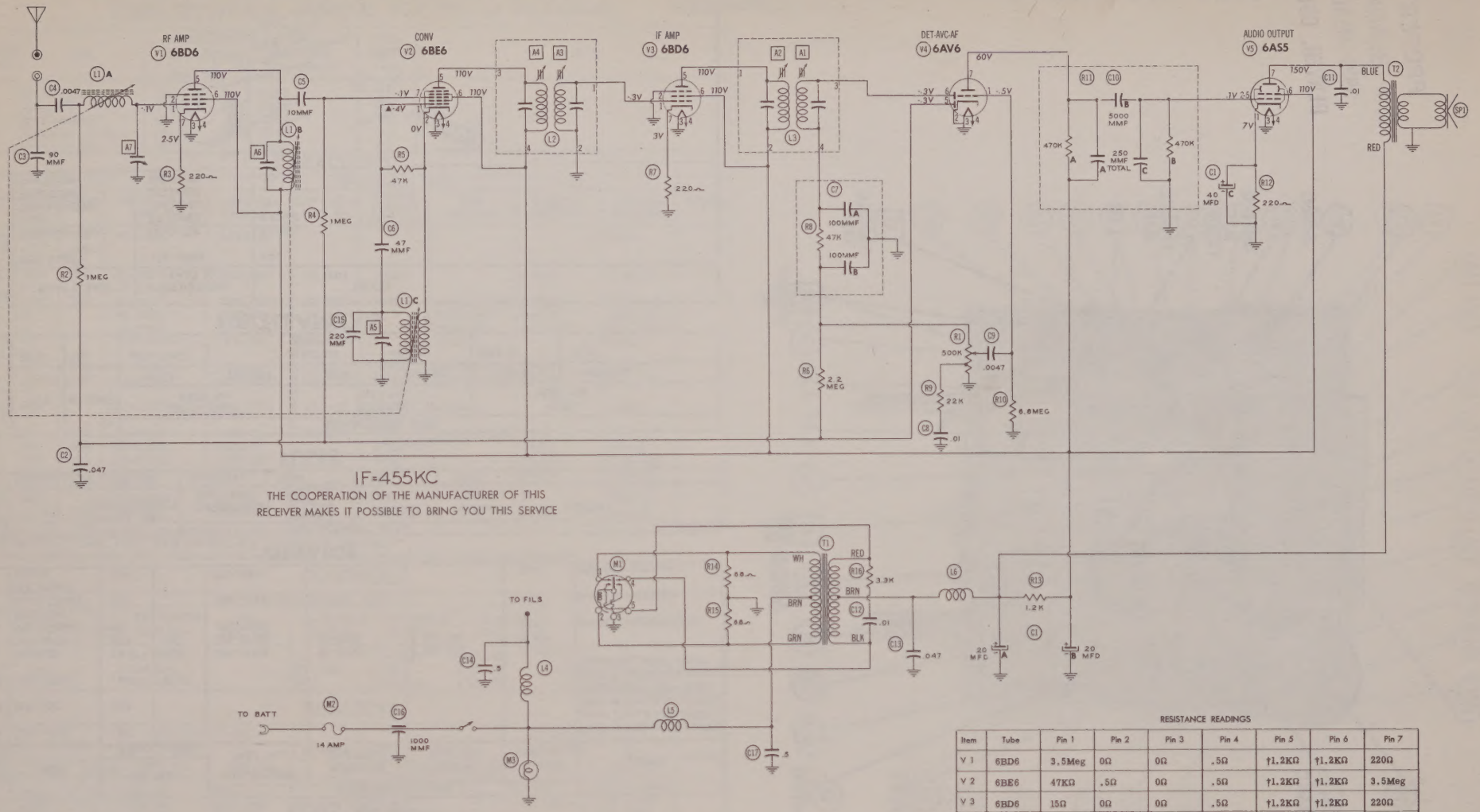
CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SET 227 FOLDER 15

TRUETONE MODEL D4320



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	3.5Meg	0Ω	0Ω	.5Ω	†1.2KΩ	†1.2KΩ	220Ω
V 2	6BE6	47KΩ	.5Ω	0Ω	.5Ω	†1.2KΩ	†1.2KΩ	3.5Meg
V 3	6BD6	15Ω	0Ω	0Ω	.5Ω	†1.2KΩ	†1.2KΩ	220Ω
V 4	6AU6	6.8Meg	0Ω	0Ω	.5Ω	3.5Meg	420KΩ	†470KΩ
V 5	6AS5	220Ω	470KΩ	0Ω	.5Ω	470KΩ	†1.2KΩ	†300Ω

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM POWER TRANSFORMER (T1) CENTER - TAP.

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1 - DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.